

A CHILTON

PUBLICATION

The Iron Age

NATIONAL METALWORKING WEEKLY

August 27, 1953

MENTS PAGE 2



Coated Steel . . . A Short Cut to Production Economy

The economy and strength of steel are combined with the functional properties of non-ferrous metals in Thomas *pre-coated cold-rolled strip steel* to give you many fabricating advantages. Being readied for shipment here is steel strip electro-coated with zinc, copper, brass, nickel and lead alloy . . . hot dip tin and lead-alloy coated . . . lacquer coated. Write for booklet.

AUG 28 1953
EAST ENGINEERING
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Thomas Strip

Thomas Strip Division
Pittsburgh Steel Company • Warren, Ohio





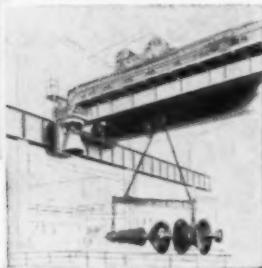
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FOR EVERY INDUSTRY!



The Trackmobile



Electric Chain Hoists



Overhead Cranes

LOOK UP!

That's where you can cut handling costs!

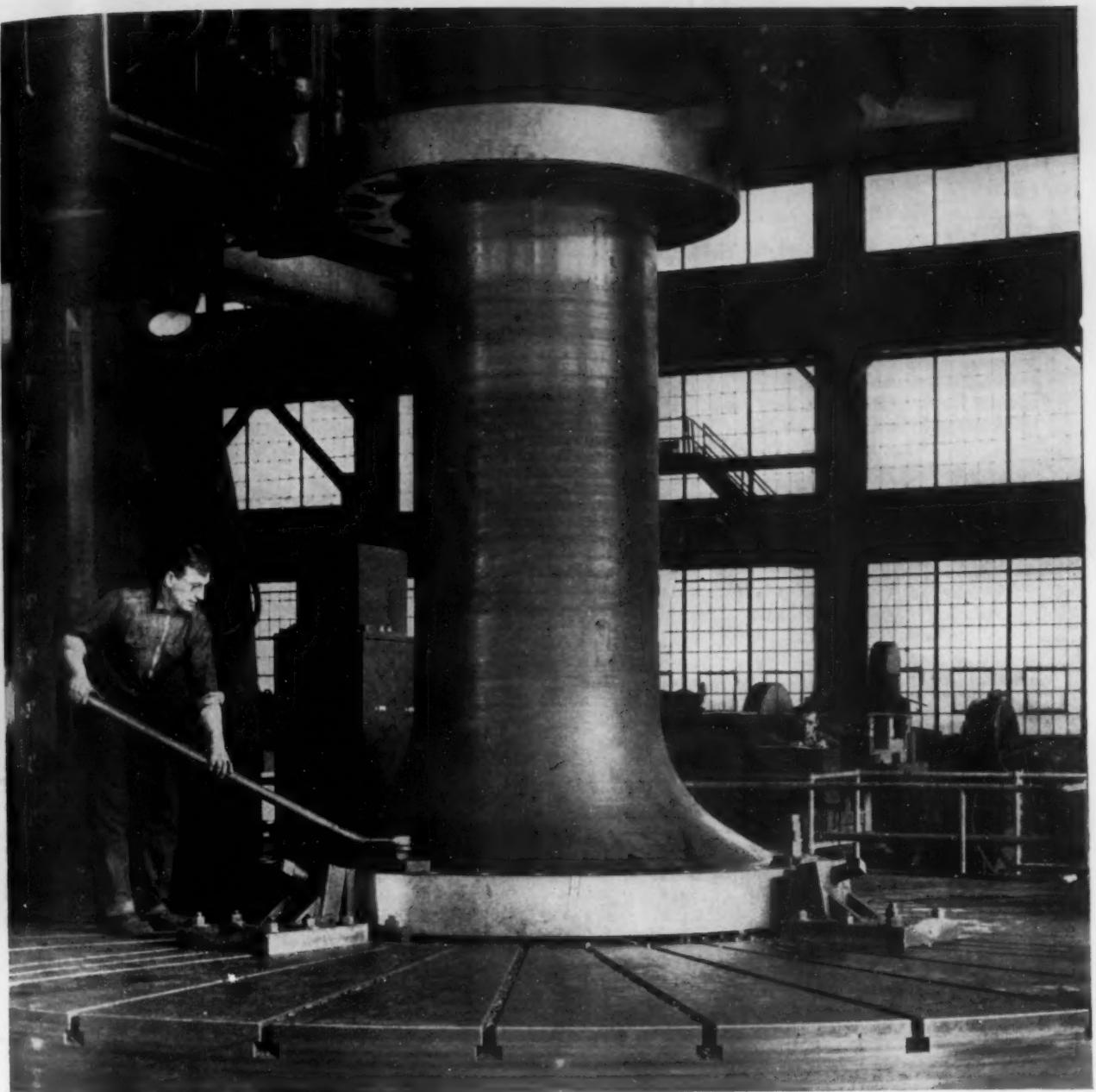
When "handling" is overhead, costs come down... materials move freely and more work is done! There you have the basic reasons why cost-conscious management likes Whiting Trambeam. It's overhead handling "tailor-made" to the job. It can give you the important advantages of fast, economical lifting, transport or stacking... plus more usable plant space, greater man-power productivity, and better housekeeping! Write for complete information today on how to turn "overhead" into profit!

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• METAL-WORKING MACHINERY



TO HELP MIGHTY COLUMBIA RIVER BRING POWER TO PACIFIC NORTHWEST

This 38-ton forged shaft is one of several that Bethlehem is supplying for the hydroelectric plant at McNary Dam, on the Columbia River. Waters controlled by the \$280,000,000 dam will provide the power for a generating system with a capacity of nearly a million kilowatts.

As shown here, the steel shaft is about to be removed from a vertical boring mill at one of the Bethlehem plants. It is a massive thing, almost 11 ft long and nearly 4 ft in diameter at the smallest point. The larger of the two flanges has a diameter of 8 ft, 9 in.

The customer's order specified that all finish-ma-

chinging except the bolt holes be done by Bethlehem.

The big forging is a good example of the heavyweights we are frequently called upon to handle. In contrast, we produce forgings as small as a child's finger. Some of the biggest and some of the tiniest forgings made can often be seen at the same time in the Bethlehem shops.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation



The Iron Age

Vol. 172, No. 9, August 27, 1953

*Starred items are digested at the right.

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DIGEST of

NEWS DEVELOPMENTS

JUDGMENT OF DMPA AWAITS AUTOBIOGRAPHY—P. 40

Retired last week at the age of two, Defense Materials Procurement Agency is writing its autobiography. It may not be a best seller but some producers of metals, minerals, economy-minded Congressmen may be interested readers. Contracts may be challenged as shortages have eased and prices have been lowered.

WEIGH ELECTRIC VERSUS OPENHEARTH COSTS—P. 43

Steelmaking economics are analyzed in a Battelle Memorial Institute study sponsored by 14 electric utilities and Bituminous Coal Research, Inc. The report finds that electric furnace shops require lower capital investment than openhearts, but operating costs vary, depend largely on scrap, hot metal balance.

GM FIRE WILL FORCE PLANT LAYOUT CHANGES—P. 44

Most lasting effect of the fire at General Motors' Detroit Transmission plant will be the changes in industrial plant design that will result. Architects expect increased emphasis on firewalls, plant size limitations, greater spaces between buildings. See exclusive photographs on General Motors rehabilitation.

NORTHWEST MAKES FIRST IRON IN 50 YEARS—P. 41

First pig iron production in Pacific Northwest in more than 50 years raises hopes that a small self-sufficient iron smelting industry can be started. Low cost power an important factor. Ore resources around Albany, Oregon, where metal was produced, are estimated at 3 to 4 million tons. Vancouver ore could be used as supplement.

GRANITE CITY STEEL'S THREEFOLD GROWTH — P. 47

"Little" Granite City steel is little no longer. It is moving into final expansion phase with completion of its 7000-hp roughing mill. Gross property holdings have been hiked from \$30 million in 1950 to \$95 million in 1953. Bulk of output is aimed at flat-rolled, low carbon steel market. Demand's holding.

GM WILL RESUME CAR OUTPUT NEXT MONTH—P. 54

Substitution of other transmissions will allow GM divisions to resume near capacity output in September despite Hydramatic fire loss. Repairs to machine tools from the gutted Detroit Transmission plant are being rushed. Tool builders throughout the U. S. are cooperating, with many working 24-hour days.

THE IRON AGE

of the Week in Metalworking

ENGINEERING & PRODUCTION

HIGH SPEED MOTION PICTURES CUT COSTS—P. 97
High speed motion picture photography can save time for your engineers, spot obscure causes of machine malfunctioning. Put to work at Lockheed Aircraft, this research tool has helped improve operation of an impact extrusion press, a rivet machine, solved an unusual flash welding problem.

GUN BARRELS DEBURRED BY LIQUID HONING—P. 102
Liquid honing has proved an effective means of removing burrs from the interior of 90-mm cannon for tanks at Oldsmobile. Blasting with fine grit suspended in water also cleans the interior surface of the gun and improves surface finish prior to chromium plating. The job takes only 45 min.

HOW TO GET MORE FROM YOUR TOOL STEELS—P. 104
In selecting a tool steel, bear in mind that tests for basic physical properties must parallel tool service requirements if it is to be of value. In deciding on toughness vs. wear resistance, no one test gives all the answers. Test methods applied to tool steels have been evaluated.

NEW MILL HELPS INCREASE ROD PRODUCTION—P. 109
Fast, simple roll changes, and use of diamond and square rolling in the roughing stands are features of Jones & Laughlin's new rod mill. Housings of unique design shift laterally to align groove and pass line. Top delivery speed is 5000 fpm. Since installation, output has been 25,000 tons a month.

COLD CHAMBER MACHINE ADDS FLEXIBILITY—P. 112
Aluminum, brass and zinc alloys are diecast economically in a cold chamber machine. More than 75 parts in a wide range of sizes are needed to keep pace with production of hoists, cranes and other products. A big advantage is the closer tie between casting availability and production needs.

NEXT WEEK—NONCORROSION FLUX AIDS SOLDERING
Aluminum and other metals can now be soldered reliably, easily and safely using a series of new fluxes. They remove oxides and other interfering films from aluminum and solder-spreading action is twice as good as that of zinc chloride on copper. It applies either as water solution or paste form.

MARKETS & PRICES

STAMPERS SING SAD SUMMER SALES SONG — P. 37
Stamping industry shipments fell about 5 pct in June and July, and fourth quarter sales outlook is not too happy. Appliance and military needs have dipped, but air conditioning demand is still strong. Last week's worry over the GM fire has lifted, though auto shipments will be down for a while. Steel is easier.

TINPLATE SALES MAY SKID NEARLY 50 PCT. — P. 39
You don't hear tinplate producers raving about business prospects in the fourth quarter when sales may slide off close to 50 pct. Totals for the year will still be respectable but a dismal outlook is being encouraged by seasonal factors, high inventories, and a sharp decline in tinplate exports.

PENTAGON IN NO RUSH TO SPEND TOOL MONEY—P. 59
The Pentagon is in no hurry to spend the \$250 million voted it by Congress for purchase of machine tools. First it will take inventory to find what government owns and what is needed. More funds may be asked next year. Drive on Federal tax delinquents is yielding more revenue than internal revenue agents had expected.

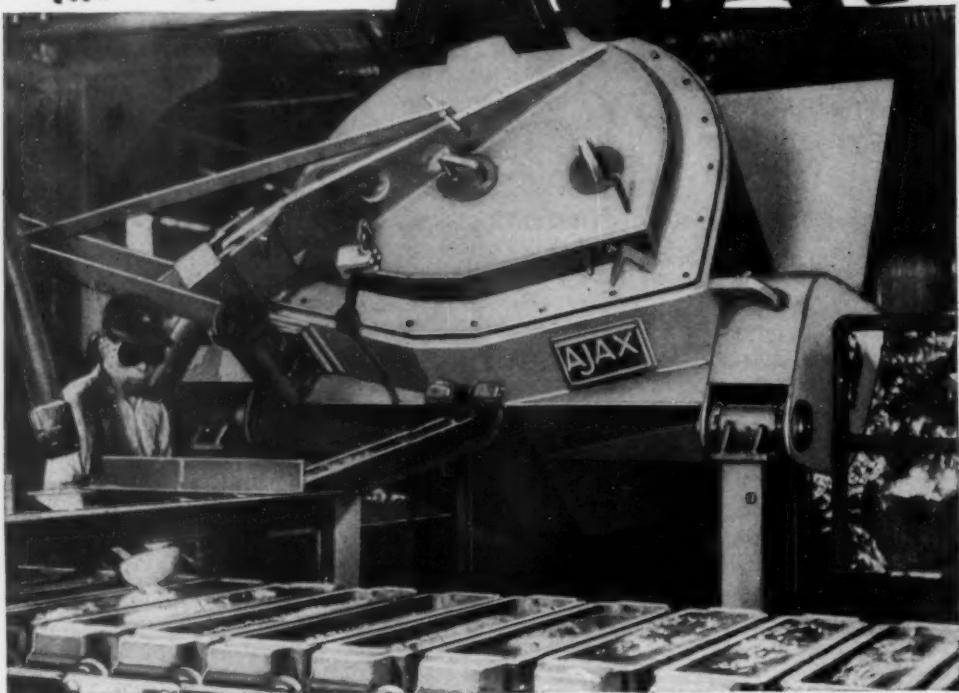
INVENTORY CUTS DON'T MEAN RECESSION — P. 67
Buyers' current pruning of inventories does not mean a loss of confidence in the economy. Understanding the PA's motives will prevent any misunderstanding. He has no incentive to stock up. Shortages are definitely over and a mild deflation is more likely than more inflationary spirals. PA's are just waiting.

BUYING ATTITUDE CHANGING STEEL MARKET—P. 121
The GM Transmission fire has stolen the headlines from the most influential development in the steel market today—the changing buying attitude of the metal user. No longer panicked by shortage into long-term buying, the buyer, fearing current production uncertainties, is planning inventory adjustment.

CHILEANS OFFER COPPER TO "ANYONE"—P. 124
Latest report is that the Chilean government, irked by slow moving Washington mobilizers, has offered its substantial copper stocks to anyone—including the Russians. It may be a lever to pry some action out of the U. S. The plan may work as the mobilizers are meeting to discuss the situation this week.

Increase your Profits—
get the highest possible recovery of aluminum scrap with
the help of

AJAX TAMA-WYATT
Induction Furnaces—



AJAX induction furnaces are used in many plants for the efficient recovery of loose scrap, such as foil, chips, borings, turnings and the like. They are also adaptable for the full range of non-ferrous metals and alloys with the same advantages obtained in aluminum, and are built in sizes ranging from 20 kw to 1400 kw.

AJAX line frequency induction furnaces will melt aluminum foil scrap with the lowest obtainable melting losses. Photo above shows an AJAX 166 kw melting furnace installed at the plant of the TOYO Aluminum Works in Yao, near Osaka, Japan. Unbaled foil scrap shown at right edge of photo is remelted at the rate of about 900 pounds per hour with a recovery of over 99%. Molten metal is poured into ingot molds as shown in the front of the photo. Another view of same furnace is shown in small photo at right.



Send for Reprint of Article on Scrap Recovery by
Induction Furnaces

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AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
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of Typical
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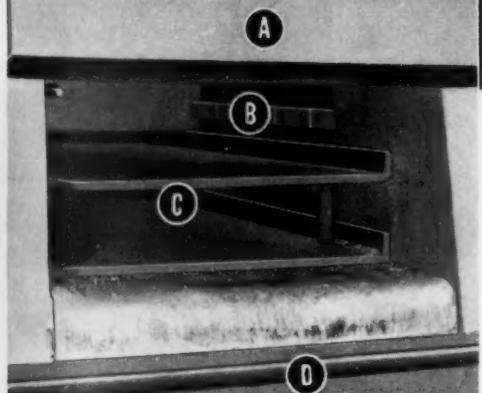
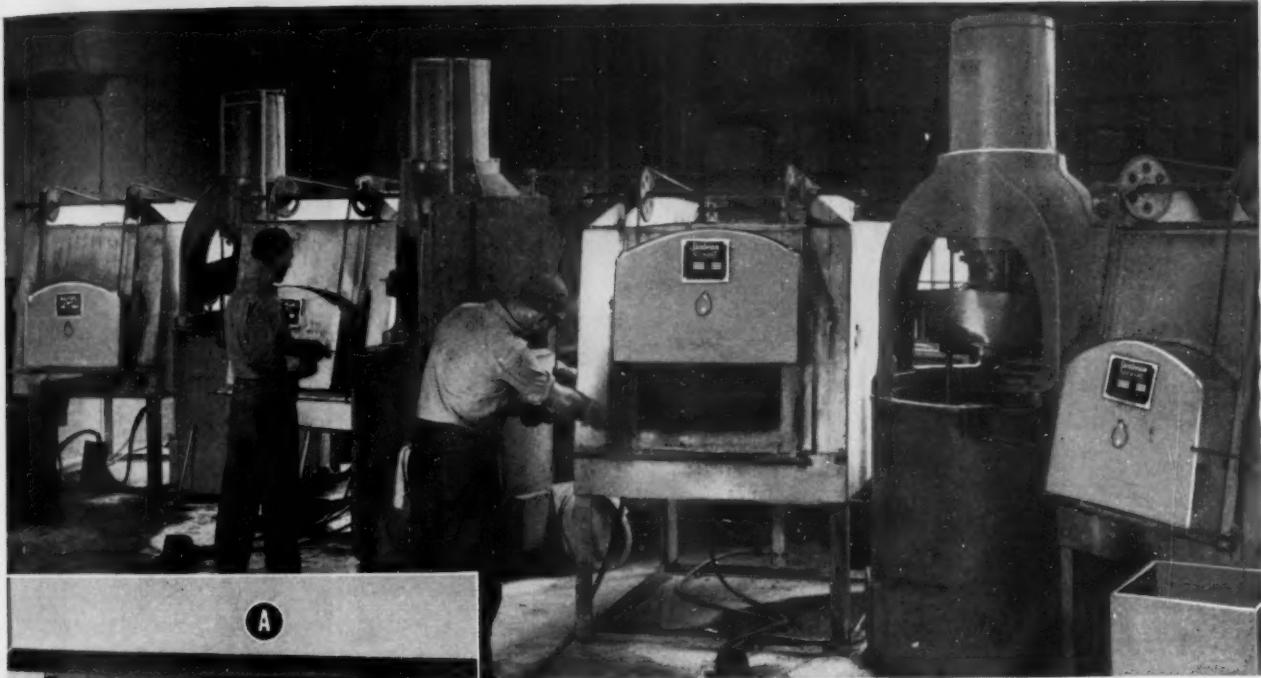
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THE BEST INDUSTRIAL FURNACES MADE

HOW
SUNBEAM INDUSTRIAL
FURNACES MEET
THE DEMANDS
ON THE
PRODUCTION FRONT

PRECISION HEAT TREATMENT OF CLUTCH RINGS

AT STYBERG ENGINEERING CO., Racine, Wisc.



Close-up view of double shelf hearth area. A. Patented Seal-tite door provides a positive seal that prevents infiltration of air into the heating chamber. B. Heating elements on 4 sides of chamber assures close temperature control and even heat distribution. C. Two shelves of 2812 alloy, one containing work at hardening temperature; the second, with work being brought up to temperature. D. Flame curtain decreases infiltration of air into heating chamber and ignites escaping atmosphere.

In the fabrication and heat treatment of clutch rings at Styberg Engineering, parallel tolerances on the sidewalls of rings 18" in dia. had to be maintained to within .0005. In addition, high physical properties with good impact and wear characteristics had to be obtained. Clutch rings varying in dia. from 9" to 18" O.D. with a wall thickness of $.126 +.000 -.004$ " tolerances are heat treated in five Sunbeam Stewart Electrically heated ovens. The larger rings of 18" dia. must pass through a gage slot .135" wide by 18" deep with walls parallel within .0005.

Due to extreme critical tolerances, automatic equipment could not handle the work satisfactorily. Therefore, a battery of five electrically heated Sunbeam Stewart double-shelf, atmosphere-controlled, oven-type furnaces provided the most practical heating equipment. One endothermic gas generator supplies the atmosphere to the furnaces. A non-oxidizing, non-decarburizing atmosphere allows full hardness to be obtained throughout the cross-section of the ring.

These Sunbeam Stewart furnaces are designed to provide high heat input with low wall losses. This is ideally suited for production requirements as extremely rapid recovery of the furnace to the control temperature occurs upon loading cold work. Rapid return to temperature reduces waiting time, allowing a larger, steadier production. Because of its wide operating range, this Sunbeam Stewart unit is ideal for general purpose heat treating including hardening of carbon and alloy steels, normalizing, annealing, and pre-heating high speed steels, etc.

IF YOU ARE CONSIDERING DEFENSE WORK CALL SUNBEAM. Designs are available for heat treating the following material:

SHELLS: 57MM; 75MM; 90MM; 105MM; 120MM; 155MM;
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FORGINGS: Rotary Hearth and Pusher-type Forging Furnaces.

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A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM industrial furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM engineer will be glad to call and discuss your heat treating problems with you.



A 20-YEAR RECORD

Here's Why Leading Crate Makers Specify SHARON Galvanite* Steel

Few items in every day use receive the rough treatment a milk crate gets . . . and fewer still are subjected to more rust provoking conditions. From dairy to truck to dairy these crates are constantly shuffled through the dampness common to the milk business.

Several leading manufacturers of milk crates have been specifying Sharon Galvanite* for a number of years. A leading Pennsylvania manufacturer told us he had tried several coated steels . . . that

twenty years ago he hit upon Galvanite* . . . that his customers actually asked him to continue its use, which he has with exceptional success.

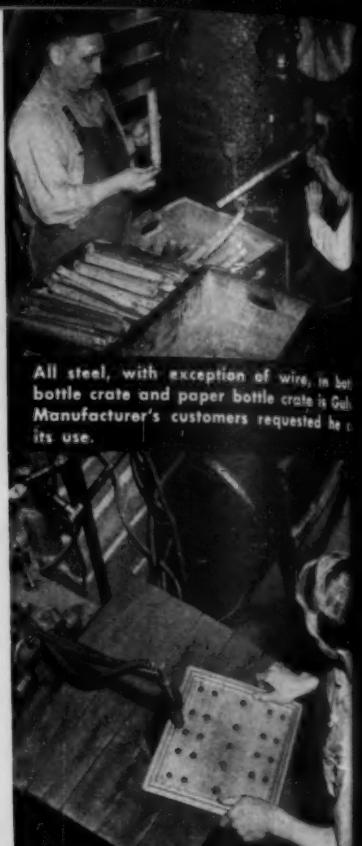
If you want rust-resisting, tough-wearing coated steel find out about Galvanite* now. There is an experienced Sharon Steel representative near you ready to give all the information and technical assistance necessary to adapt this exceptional steel to your product.

*Trade name copyrighted by the Sharon Steel Corporation

Where Rust is a Problem . . . Specify Galvanite

SHARON STEEL CORPORATION

Sharon Pennsylvania



All steel, with exception of wire, in both bottle crate and paper bottle crate is Galvanite. Manufacturer's customers requested its use.



Galvanite* forms well . . . no baking or
ing . . . Galvanite* will spot weld.

Typical milk crate sections made of Galvanite

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and the Engineering Index.



Editorial

The Iron Age

FOUNDED 1855

Our Day of Realization

THE day our government belatedly confirmed Russia's claim to H bomb possession was a milestone for us. There will be no peace or security for the free world if we muff our role as leader. Up to now we can't be too proud of it.

There is much for us to think over. Don't we need to take another look at our defense plans? Isn't it now clear that a balanced budget carries no guarantee that we will be alive 5 or 10 years from now?

Shouldn't we quiz ourselves brutally as to whether we could meet and withstand a Soviet sneak attack? Talk of retaliation has a hollow sound considering the speed with which the Communists have mastered atomic weapons technique.

Dare we recall that two world wars for freedom didn't bring freedom? Should we remind ourselves that the Korean war settled nothing except that freedom without compromise is a costly privilege?

Would it not be wise to realize that Britain and France often act as though their own domestic affairs meant more than safeguarding liberty? Is it not time that we stood on our own feet without it being necessary to go it alone?

Wouldn't it be fair to draw the line on truth as we see it and "mature" judgment as others see it? Among some older nations where does maturity end and decadence begin? What has the Old World's diplomacy produced in the past 500 years? Anything better than a try at spiritual honesty which Americans have tried consistently to bring to the global table?

Should we pause and realize just how much freedom we have and what sacrifices we can make to hold it? Are we ready to face this question honestly?

If we can meet these questions without fear; if we can be realistic without sacrificing our spiritual values; if we can meet force with force, arguments with arguments and meet deceit with honesty then there is a chance.

But if we trade truth for expediency; if we give up what made us what we are; if we buy security while selling our souls; and if we believe that freedom isn't worth the awful price we are going to have to pay for it—then the Lord help us because we won't be able to help ourselves or others.

Tom Campbell

Editor



DOW CHEMICAL saves thousands of dollars annually with BAKER TRUCKS

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products in bags or cartons on pallets—taking them from production to storage, where they are high-tiered to conserve floor space, and from storage to shipment, where further man-hour savings are made in loading.

Material was formerly transported manually and hand-stacked. Cylinders were rolled by hand, one at a time. The use of Baker Trucks has resulted in savings of thousands of dollars annually.

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industrial trucks

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Material Handling and Construction Equipment

Dear Editor:

Letters from readers

How Far Can We Wander?

Sir:

Your editorial "How Far Can We Wander?" which appeared in the July 30th issue was magnificent.

I read THE IRON AGE in my professional capacity as Assistant to Chief Engineer of The Baltimore & Ohio Railroad Company, but I am particularly interested in this editorial, as well as some of your other editorials, in my extra-curricular activity of trying to arouse the people of this city to the menace of socialism and communism. In this latter work, I am Chairman of the Planning Committee of the Maryland Action Guild, an organization of Catholic laity.

I am wondering if you would have a number of copies of this editorial available to send to me for distribution by the Guild.

G. D. O'Neill

Chairman, Planning Committee
Maryland Action Guild
Baltimore, Md.

Steel: A Good Neighbor

Sir:

The July 30th issue contained a special report entitled "Steel: Pushes Its Good Neighbor Policy."

We feel that this is an extremely enlightening article. We should like, if possible, to have your permission to distribute copies of this article, with due credit to THE IRON AGE, to individuals within our own organization. Accordingly, we shall appreciate it if you will allow us to do so.

F. N. Hoffmann

Legislative Representative
United Steelworkers of America
Washington, D. C.

A Quick Hot Lunch

Sir:

In the August 6th issue, under the heading "Newsfront," appeared an article regarding a new plan for quick hot lunch in plant service which you expected to be announced soon.

This item was very interesting and we would appreciate being informed as to who we should contact for further information.

D. F. Grace
Vice President

Chicago Steel Service Co.
Chicago, Ill.

Further information about this new plan may be obtained from the Cooper Industrial Food Service, Inc., 30 West Randolph St., Chicago, Ill.—Ed.

Goodby Citizen Taft

Sir:

I appreciated very much your editorial in the August 6th issue entitled "Goodby Citizen Taft." Could you possibly send me a reprint of this editorial for a recent high school graduate who is making a collection of tributes to and writeups about Robert Taft?

Mrs. Glengene Martin
Librarian

Armeo Steel Corp.
Middletown, Ohio

Vacation v. Industry

Sir:

I am interested in the problem of staggered vacations versus all-at-once vacations in reference to suspending production and clerical operations in a company to cover the employee vacation period. I have been unsuccessful in obtaining a reference source for this topic and would appreciate your advising me of any discussion or statistical material that you have knowledge of.

C. O. Pfisterer
Training Coordinator

Dunkirk Plant
Allegheny Ludlum Steel Corp.
Pittsburgh, Pa.

We have published in the July 16th issue, page 76, an article entitled "Vacations: Industry Takes Breather" which should be of help to you.—Ed.

A Foreman Speaks Out

Sir:

Would it be possible to secure reprints of the editorial "A Foreman Speaks Out" for distribution to our membership? If not, could we secure your permission for reprinting and distribution?

W. H. Strauss
President

Waynesboro Manufacturers' Assn.
Waynesboro, Pa.

Dornin Ingots Process

Sir:

We note with interest the article in your July 16th issue entitled "Steel: Green River Pours First Heat," which concerns the Dornin Ingots Process. May we have a few tear sheets of this article?

J. W. Linhart
Steel Roll Metallurgist

The Ohio Steel Foundry Co.
Lima, Ohio

for
**BRIGHTER
CLEANER
METALS**
add
NOPCO* 1067-A

NOPCO 1067-A is an unusual liquid surface tension depressant designed for mineral acid solutions. Since it affords deeper and more uniform penetration of oxide scale, its use results in a much brighter and cleaner surface and elimination of pitting.

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SAVES SPACE

Heating bars in a furnace one-third shorter than the length of the bar itself is typical of Selas Improved Heat Processing. One company using a 14-foot high-speed radiant, gas-fired furnace doubled its previous output rate in tons per hour of 22-foot bars.

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Fatigue Cracks

by William M. Coffey

Inside The Iron Age (III)

From time to time we get letters from subscribing friends who say that we should give some serious thought to changing our name, THE IRON AGE (*didn't you know?*), in view of the fact that we cover *all* metals and Fatigue Cracks, too. They very kindly point out that we may be losing some likely subscribers 'cause a chap may say to himself "why take IA? I deal in aluminum and molybdenum with an occasional dab in zirconium."

We don't budge, however, because all the world knows THE IRON AGE, which has been around for nigh on a century and, of course, such a well-known trade mark is not lightly to be discarded even though it may tend to give newcomers an erroneous impression. And on the other hand, too, iron still seems to be king as substantiated by the following, penned by famed scientist Mr. Clyde Williams, Director of the Battelle Memorial Institute. We quote from the Institute's Monthly Business Review:

"New and improved products are constantly being developed to meet the needs of economic and scientific progress. We hear much of the continuing expansion in markets for the versatile metal, aluminum . . . titanium . . . germanium . . . aluminum-antimony . . . molybdenum . . . zirconium . . .

As welcome and necessary as such developments are, one fact remains indisputable. Iron and steel continue to be our most basic materials of construction. No other structural materials have the same combination of strength, cheapness, and versatility. We are still living in the "Iron Age." Any other "Age," whether it be "Chemical," "Electronic," "Atomic" . . . must necessarily depend on an abundant supply of low-cost iron and steel."

We have great respect for Mr. Williams and the Battelle Memorial Institute. As a fine source for scores of technical articles reporting the latest in technical progress, metallurgy and a host of other subjects likely to result when over 1000 of the nation's top scientists focus their brains on various sponsored projects, it is a top drawer outfit. Real sterling in our book. So with such an authority to back us up it is not likely we'll change the name to some other Age yet awhile. At least, don't hold your breath.

Incidentally, did you notice that it was last week's newspapers, dated Aug. 20 that first announced the Russians had exploded an H-Bomb? And did you notice also that Tom Campbell in his editorial of *same date* said "... some of our people deride Russia's ability to have atomic secrets, weapons and the economy to support A-bomb and H-bomb manufacture. This is sheer folly. . . ." That's the type of timing that's kept THE IRON AGE around for nigh on to that century.

Stable d'Hoté

Next time you get to Charleston, W. Va., eat at King's Restaurant. We had a delightful dinner there. Started off with *Stuffed Schlumeel with Trifles* (\$13.95)—the wife had *Mother of Pearl-in-Law with Ground Sea Shells* (10 centimes). For the fish course we took *Young Whale stuffed with New Buick* (\$3500) and the boss had the same stuffed with '37 Ford (15¢). They were serving that day *Octopus Au Gratin with Apple in Mouth*, but it was enough for 20 so we didn't dare. The meat course came next and the *Hippopotamus Jowls with Black Eyed Peas* (35¢) was the best we've ever had.

The Chief went through *Ragout de Cheval et Lapin* which actually was stew concocted of equal parts of horse and rabbit — one rabbit to one horse. We topped it off with *Mousse Moose* (\$2.50) and the wife had *Moose Mousse* (\$2.55). Then we turned in.

Puzzlers:

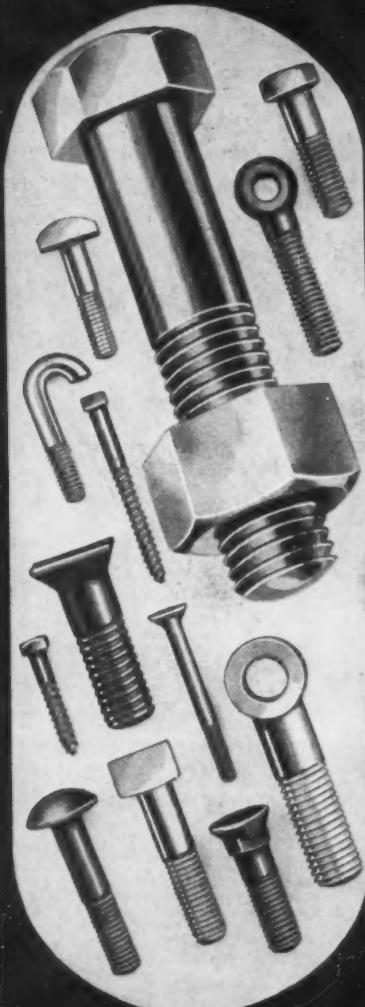
The answer to the Aug. 6 puzzler about the cows, pigs and chickens is: 5 cows, 1 pig and 94 chickens. We should have said that 100 head of stock had to be bought. Without this additional information, however, Ledr. Garrett USN, Mrs. Constance Parche, John Cernak, H. G. Craig, Y. Barcon, Thomas Hindley, Frank Craner, Joe Levine, Miss MacGuire, Alfred Mayer, Jr., David Morgan, Henry La Croix, Paul Kuhn, John McKeon, Bruce Norman, H. H. Nordlinger and Mr. Rice came through as winners. Things are picking up.

New puzzler: An amoeba grows to double in its initial size and divides into two amoebae. Assume, that the process takes a minute. A single amoeba is placed in a gold fish bowl. The bowl becomes full in 40 minutes. How long does it take for the bowl to become half full?

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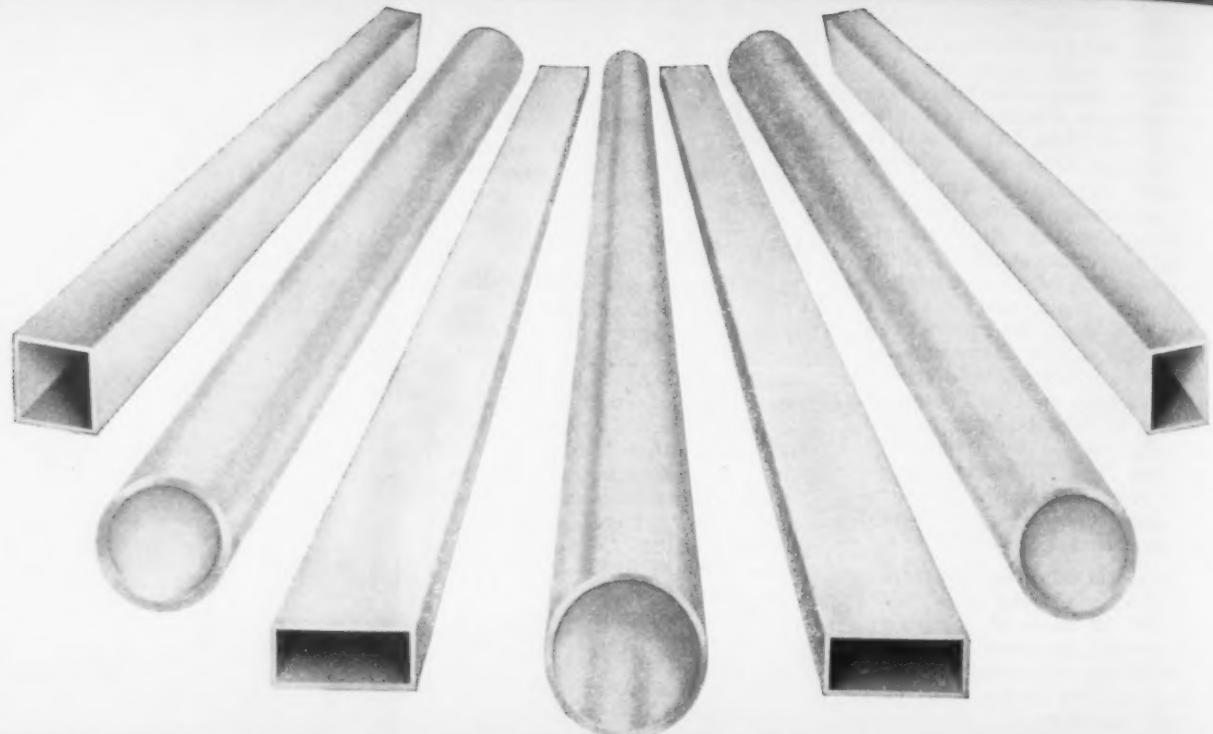
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THE IRON AGE Newsfront

THE INSURANCE FRATERNITY, which may take a \$28 million loss on the General Motors Transmission fire, will pressure builders to break up single line plant designs into at least two or three sections, separated by fire walls. GM and other big companies are reviewing their own fire protection measures.

INDUSTRY'S CASE FOR NICKEL DECONTROL is looking better all the time. Military supplies can be assured by the same simple system of set asides being used for other metals. Civilian supplies would be distributed by voluntary allocation or quota system as they have been in the past.

STEEL SCRAP PRICES seem to have passed their peak--at least temporarily. But don't look for any big decline as long as steel producers have big order backlogs. A sharp price drop would dry up a lot of scrap sources due to high collection costs.

MACHINABILITY TESTS ON BORON STEELS made for the Ordnance Corps show that the 7 boron grades examined machined as well or better than their equivalent standard alloy steels using either high speed steel or carbide tools. Better annealing of the boron steels would have helped more.

GOAL OF GREAT LAKES ORE SHIPPERS is a 105-million ton year. They've been breaking records almost every week of the current season, feel that predictions of a good fourth quarter in steel should help make this record. But it looks a little high.

LOOK FOR A MIRACLE by General Motors in resuming automatic transmission production. Typical job: Equipment was already being moved into Willow Run before lease agreement was signed.

NEW PRODUCT DEVELOPMENT, long neglected by many companies is being dusted off for the coming competitive period. Some firms have been quietly working along these lines, will spring new products soon. Others are beginning by appointing top management people to "new product" committees.

U. S. SHIPBUILDING industry, heading for heavy weather, will be under water by 1955 at present rate. Not a single major ocean going vessel has been ordered from U. S. yards since last November. Some 31 ships will be delivered this year, only 38 will remain under construction at year's end. Cutting building subsidies from Federal budget didn't help.

INDUSTRIAL RADIOGRAPHY may grow with cesium 137, now being used to inspect for part defects and misalignment. It has a 33-year half life. With its intermediate energy level it bridges the gap between iridium 190 and cobalt 60. A fission product, availability should increase in the future.

RUMORS OF COMING STRENGTH IN GOLD CONTINUE. Some quarters claim the U. S. monetary gold reserve is too small to support a severe strain. One suggested solution is to let the Treasury keep its \$35 price while freeing the metal for industrial use. And of course, for speculation.

IMPROVED SPECTROGRAPHIC ANALYSIS of openhearth steel samples is being achieved by a major steel company with a miniature laboratory rolling mill. The foot-high mill cold rolls samples to increase density, reduce porosity of conventional cast samples for easier analysis.



Distant and close-up views of 6 EC&M, Bulletin 1062, 2300 volt Starters and Line Panel for vertical deep-well pumps.

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When plans call for 2300 volt power, the motor drives connected to this source take on added importance—they are generally considered "main-line" and highly essential to a plant's output. Such drives deserve "all-out" protection and EC&M Type ZHS 2300-4600 volt Motor Starters are designed to provide it.

Illustrated above is a typical installation of these EC&M Starters. Main line contactor is the well-known Type ZHS Magnetic Contactor having high interrupting capacity—ability to provide frequent starts and stops with only routine inspection. Front cubicles are the aligning type; self-contained bus is an optional feature. Safety door interlocks open the contactor circuit and avoid pulling disconnect switches under load. Push button starting brings each motor up to speed with greater skill than human hands could do it.

When making initial cost estimates, get the facts on EC&M High Voltage Starters. Our nearby office will be glad to supply full information on starters which give complete protection.

STAMPERS: Sing Sad Summer Sales Songs

Industry shipments off about 5 pct in June, July . . . Last quarter outlook muddy . . . Appliance, military needs dip . . . Auto gloom lifts . . . Steel eases—By R. M. Lorz.

Midsummer's Night didn't find the stamping industry much in the mood for dancing with joy. Some producers say business is good but most are down in the mouth. Industry shipments fell about 5 pct in June and July and the fourth quarter outlook is generally muddy.

Producers who send a heavy volume to the appliance people report shipments have slowed to a walk. They say the only bright spot in that field is air conditioning which continues to boom along through August heat.

Military requirements have also been sliding. But seriousness of this trend is usually overemphasized by experts outside the industry. Those who decry loss of defense business usually don't realize that stampers generally handle so-called expendable items. Volume on these has been averaging 12 pct throughout the industry.

No Fire Panic

The General Motors fire hasn't caused any panic in the stamping industry. There was some confusion early last week when fabricators and shippers got the red light, but the jam has eased. Announcement that substitute transmissions would be used insures partial production and gloom has lightened.

Captive shops will continue to feel the blow. They have been idle for some time at Hudson, Nash and Kaiser. As a result of the fire others turning out stampings for Cadillac, Oldsmobile and Pontiac will probably operate at or near half speed.

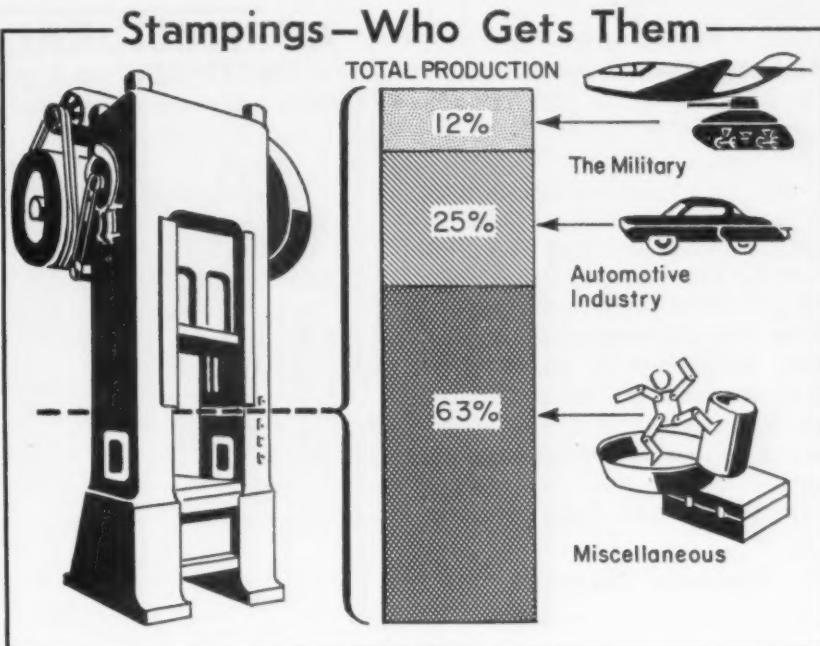
Effect of this slowdown will be spread over a wide enough area to prevent serious dislocation in

most job stamping shops. Stampers interviewed by THE IRON AGE say the holdup will cause shipment reductions ranging from 2 to 25 pct. This should average out to a

is expected to dip even further during the fourth quarter.

While the sales picture has dimmed within the past few weeks materials have eased considerably. Fabricators still can't get all the mill sheets they want on fast delivery. The fourth quarter picture should be better.

One stamper already reports



6 pct drop to suppliers doing business with GM. Heaviest blow will fall on those who make components for GM bodies.

At the present time the entire stamping industry is shipping an estimated 25 pct of its total production to the automotive industry. Approximately 12 pct of the remainder goes to the military. A whopping 63 pct is listed as miscellaneous.

Automotive production generally is slipping. Most stampers began to worry about Detroit as early as the second quarter. Their fears apparently were justified because automotive volume has slipped and

hearing from people he didn't even know were selling steel. His experience may be a trifle rosy but it's no secret that warehouse steel has become more available to stampers, especially in the lighter gages.

Medicine men in the industry who hope to cure the slight sales relapse believe they see better things ahead. Christmas sales should give the industry a lift in this direction. On a long range basis revision of corporate tax structure will also improve the situation.

Many stampers state quite frankly that the profits tax has left them

MACHINES: Skim Cream Off Farm Sales

**Postwar agricultural equipment backlogs virtually eliminated
... But Commerce sees stable market ... Buying gets selective ... See more truck sales—By A. K. Rannels.**

Indications are that farmers are taking a second look at agricultural equipment displays and asking themselves, "Is this purchase really necessary?"

This points up the fact that the cream has been skimmed from the postwar farm capital equipment market. The going will be rougher for producers and dealers—but this isn't necessarily a cause for alarm.

Since 1949, according to a U. S. Commerce Dept. analysis, farmers have been spending \$3.5 billion a year in capital goods, both new and replacement.

This rate has been considerably higher proportionally to farm income than the historical rate. Unusually heavy buying is largely attributed to postwar backlogs.

As a result, farm stocks of capital equipment increased more than 50 pct after 1946. Discard and scrappage rates rose, bringing a decline in overage machinery.

Backlogs have been steadily

eliminated. From here on, buying is likely to be more selective.

For example, postwar tractor buying has been running at a higher ratio than truck procurement indicating that a truck purchase might be favored in the future.

Nevertheless, the government looks for the farm capital goods

market to remain relatively stable, partly from introduction of new equipment for operations not usually mechanized before.

How It Looks

Federal economists emphasize that these opinions are an analysis rather than a forecast. But carrying the "analysis" a little further it is concluded, for example, that:

From a unit volume standpoint, net annual tractor purchases are not likely to change much. Only the rate of increase in farm stocks would decline—about 3.5 pct by 1960.

Not much market can be expected from farms not now mechanized. A substantial portion of farms now without tractors are of the 50 acres or less variety.

Trucks Will Rise

But replacement demand is currently running around 200,000 a year. This can be expected to rise to 300,000 by 1960, with the biggest increase coming after 1957.

As for motor trucks, farm stocks may well be expected to increase at a faster rate, particularly if helped along by promotion.

Additions are seen as not exceeding 100,000 trucks a year through 1960 unless the industry puts forth special effort.

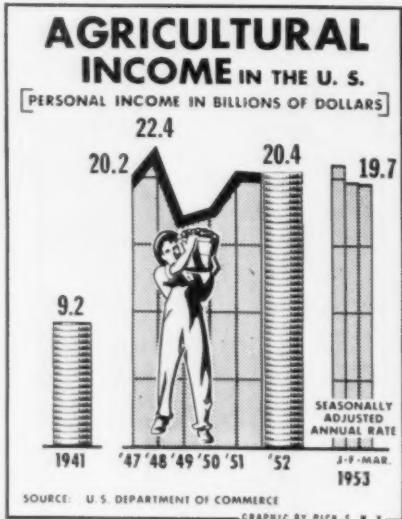
But total farm truck sales are expected to rise from the present 200,000 rate to nearly 300,000, due to increasing replacement demand.

Have Good Cushion

Logical conclusion is that the bulk of the farm market will be in replacements. It is now estimated as running at around \$1.2 billion in terms of 1947 dollars.

It is seen as remaining relatively stable for the remainder of the decade, picking up by something like \$100 million a year unless there is a sharp economic drop.

Supporting this thinking is the fact that farmers have managed to pile up an additional \$2 billion in liquid assets since the war.



Special Report

Continued

without a safe margin of working capital. Consequently small operators have had to cross their fingers and patch up old machinery when possible.

One Philadelphia stamper recently licked the problem by rebuilding a 300-ton press at a cost of \$5000. A new press would have cost about six times that much. While many stampers have been able to make do in this fashion they still yearn for the chance to build up a working reserve for expansion and modernization.

Stamping industry plans for business in '54 revolve around several long range campaigns which should pay dividends. On the pro-

duction level they are aware of plastics and are working overtime to come up with efficient, economical ways to handle it. Fabricators have also done some fence mending with the basic steel industry and both seem to be moving into an era of close cooperation.

Wages and costs haven't presented any serious problem to the industry so far. Most press operators got increases which followed the basic steel pattern. Wage increases and added steel costs were in most instances passed on to the consumers. The pass-through was put into effect with a minimum amount of fuss although some automotive firms balked a little.

TINPLATE: Sales Seen Sinking 50 Pct

No producer is raving over fourth quarter prospects of tinplate sales . . . Business may flop 50 pct . . . Outlook dimmed by seasonal factors, stocks, exports—By J. B. Delaney.

Tinplate producers are anything but enthusiastic over sales outlook for the fourth quarter. Indications are that business will be off close to 50 pct from the average for the first three quarters.

However, average for the year will be no worse than some observers had expected. When the final tab is added up, shipments are expected to approximate 85-90 pct of the industry's 6.5 million ton capacity. But virtually all the decline will come in fourth quarter.

Reasons for the dismal outlook include (1) seasonal factors, (2) high inventories, and (3) a sharp decline in exports.

Pig Tin's Cheaper

The softening market is likely to be a factor, although not necessarily a deciding one, when producers and the can companies negotiate new price contracts.

Current price agreements, which expire Sept. 30, were based on pig tin at \$1.20 per lb. Since then, pig tin price has declined to 80¢ per lb. Offsetting this are higher labor and other costs imposed on the steel producers in the interim.

Can company inventories, both in their own plants and in warehouses of producers, are high. Major contribution to this buildup was heavy buying stemming from consumer hedging against a possible steel strike, which did not materialize. Also, some food packs are not up to expectations.

Equalize Freight Costs?

Generally, the cutbacks hit all producers equally hard. The two largest consumers cut fourth quarter orders substantially.

As expected, the cutback in orders is accompanied by a critical look by consumers at shipping costs. This places mills farthest from consuming points at a com-

petitive disadvantage which may resolve into equalizing freight to get the business.

Estimates of the coming decline in exports run as high as 70 pct. This market has been falling off for some months as foreign mills increased their production and the dollar scarcity continued to curb purchasing power abroad.

Incomplete statistics from Office of International Trade don't reflect the decline and it was estimated that the first quarter total of 131,000 tons would be exceeded.

Shipments in April amounted to 56,500 tons. May exports were recorded at 49,000 tons.

Value of Exports

But trade in tinplate will have to improve markedly if totals for 1952 are to be surpassed. In the first quarter last year exports reached 184,500 tons, valued at \$35.8 million. Figures for the second quarter were 149,000 tons and \$29 million; for third quarter,

72,000 tons and \$13.5 million; and for fourth quarter, 204,500 tons and \$39.4 million.

First quarter 1953 exports were valued at \$28.5 million. Values for April and May, respectively, were \$10.3 million and \$9.1 million.

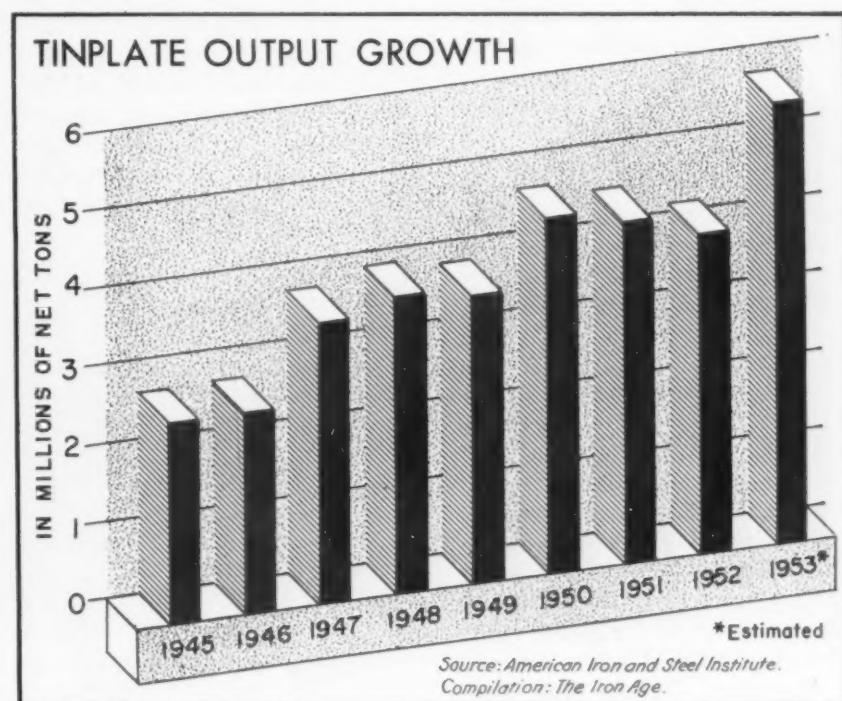
Countries of destination are well scattered, though Brazil, Argentina, Australia, and The Netherlands are among the large importers.

Open-end quotas are applied to tinplate by OIT. This means there are not quantitative restrictions, but a validated export license is still required.

File Nickel Export Applications

U. S. Office of International Trade has set the period Sept. 14-28 as the time for filing applications to export the following nickel and selenium commodities during the fourth quarter:

Nickel welding rods and wires (Sched. B No. 619039), powders and flakes, including nickel-chromeboron (6193459), catalysts and slugs (619950), nickel and nickel alloys and semifabricated forms except scrap (654503 through 654519). Many other nickel and selenium commodities are also included.



DMPA: Retires—Is Ready to Be Judged

Crisis agency for procurement of shortage metals retired last week . . . Some contracts challenged as shortages have eased and prices have come down—By R. M. Stroupe.

Retired last week at the age of two, Defense Materials Procurement Agency is writing its autobiography. Although it won't become a best seller it will get some intensive reading from congressmen who are economy minded or who represent domestic producers of metals and minerals in competition with mines abroad.

Still fresh in memory are fierce metals shortages arising after the Korean outbreak that threatened to hobble our productive plant as it swerved to rearmament. To get such metals as copper, nickel, manganese, chrome from home sources and from all corners of the globe, DMPA let purchase contracts to assure us safe future supplies.

But shortages are now over, prices have come down. Once U. S. firms were clamoring for greater imports of copper. Recently American copper producers railed against a rumor that England was planning to dump copper on the U. S. market. Critics of DMPA will stand up and question the validity of long-term, now expensive contracts with foreign producers and point to current abundance and lower prices.

Statistics Coming Up

Still DMPA critics will no longer be attacking a live agency, for DMPA's emergency functions have been transferred to General Services Administration.

Friends and enemies will be shown just how much DMPA paid for materials of U. S. and foreign origin, and how much must still be paid before current contracts are completed. So far, the record isn't complete—there are blank spaces following the dollar signs.

A preliminary count indicates the agency signed some 78 development and purchase contracts. Many of these will run on for years, while others will be fulfilled by the end of December. Certain firms were

ready to begin deliveries as soon as agreements were signed; some will not be in full production before 1956.

Roster of Contracts

There's variety in the list of materials covered by DMPA contracts. Manganese contracts number 21 and copper agreements 20. After these two, the lineup includes:

Nickel, 9 contracts; zinc only, 6; titanium sponge and brookite, 4; columbium-tantalum, 3; chrome, 2; cryolite, 2, including 1 for synthetic; fluorspar, 2; molybdenum and molybdenite, 2; lead and zinc, 2; lead only, 1; and beryl, cobalt, ferromanganese, and dead burned dolomite, 1 each.

Well over half the manganese contracts went to Mexican production. Of more permanent interest, perhaps, are two domestic contracts aimed at determining whether usable manganese can be derived from low-grade ores. Reports from firms operating these projects are expected next spring.

Copper contracts are with U. S. firms, except for one with Campbell Chiboughamau Mines, Ltd., of Montreal. This firm agreed to supply 63 million lb by the end of 1956. Several domestic contracts call for higher-than-market prices to cover heavy operating costs.

Hanna Coal & Ore Corp. and

Hanna Nickel Smelting Co. are the only U. S. firms holding a DMPA joint agreement to mine and smelt nickel. These companies are to start delivery in 1954 on a minimum of 95 million lb, to be produced by mid-1962. The remainder of the DMPA nickel contracts were made with Canadian firms.

Four of the six zinc contracts call for domestic production. These are short-term arrangements for zinc from Wisconsin, Missouri, Kansas and Tennessee. Latin-American zinc is involved in the two remaining contracts.

Can Brookite Be Used

Cramet, Inc., Titanium Metals Corp., and Du Pont signed agreements to provide titanium sponge. The brookite project is a research job undertaken by National Lead, which intends to determine whether domestic brookite can be used in production of welding rod coating and titanium metal. Government portion of the costs of this study amounts to \$20,000.

Looking over its notes on arrangements made, DMPA opines that it handled federal funds in a sensible manner. It used Bureau of Mines experts and other trained engineers in determining whether a mine was a potential producer or a poor bet. Contract details were worked out by negotiators familiar with the applicable law.

Factors Were Obscure

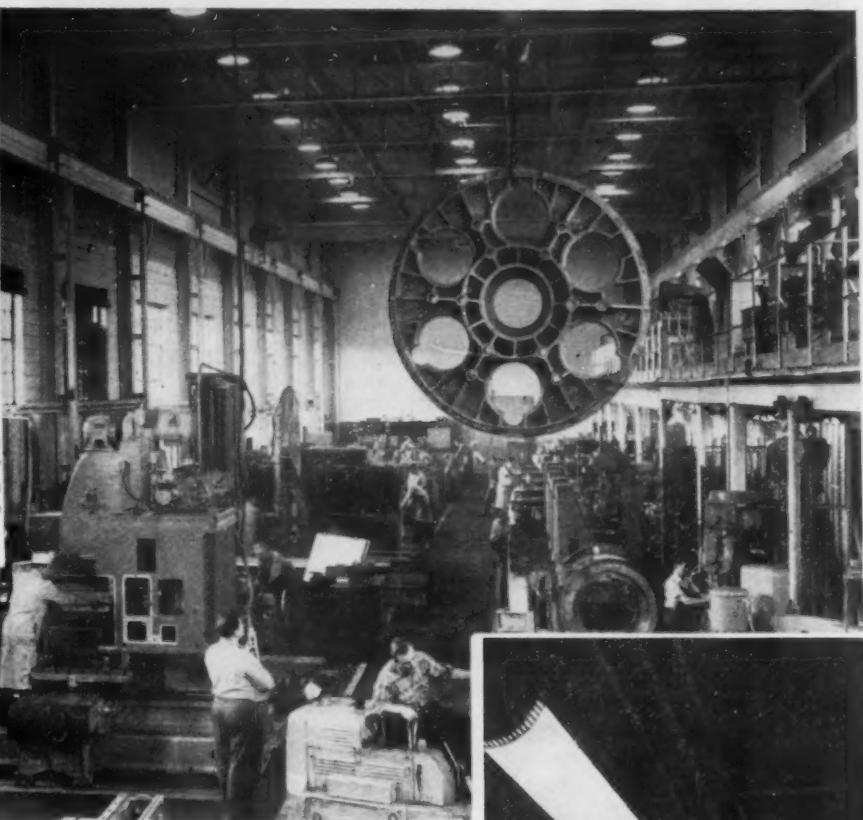
The agency admits it bit into an occasional lemon, but it told THE IRON AGE most of its decisions were sound. DMPA contention is that there was a clear understanding of the problems involved in establishing, on a long-range basis, a production base adequate to cover a crisis.

Too many short-term contracts would have meant an excessive stock-piling of some items as early as 1955. Long-term agreements held the danger that maximum deliveries might not be made until it was too late for industry to use them or after shortages have eased. The situation called for certain decisions based on obscure factors.





BRAINS behind Ace-Central States combined design-build service for automation equipment are builder Fred Gollbach (left), designer John Allmon. "Build" end of the service is at Ace Tool & Die Co.'s plant shown here.



Make Automation a One-Phase Job

Ace-Central States Machine Tool Co., Detroit, was formed recently to provide the automotive industry and other users of automation equipment with a single organization that would be responsible for both designing and building complex automatic machinery.

Organization of the company was almost inevitable. For 10 years, Central States Engineering Corp. has been designing special automatic machinery for the automotive, aircraft, farm implement and other industries. And consistently manufacturers selected Ace Tool & Die Co. to carry out these designs.

Because of this close association, the two companies, while continuing to operate independently, decided to organize a third firm that would be able to provide a combined design-and-build service. As a result, Ace-Central States is able to offer customers the skills of 140 design engineers and 200 tooling specialists.



STILL A TRADE SECRET is an automatic machine recently completed by Ace-Central States Machine Tool Co. which assembles parts for massive road-building equipment. Machine cost \$100,000 but it eliminates the use of several manually operated presses.



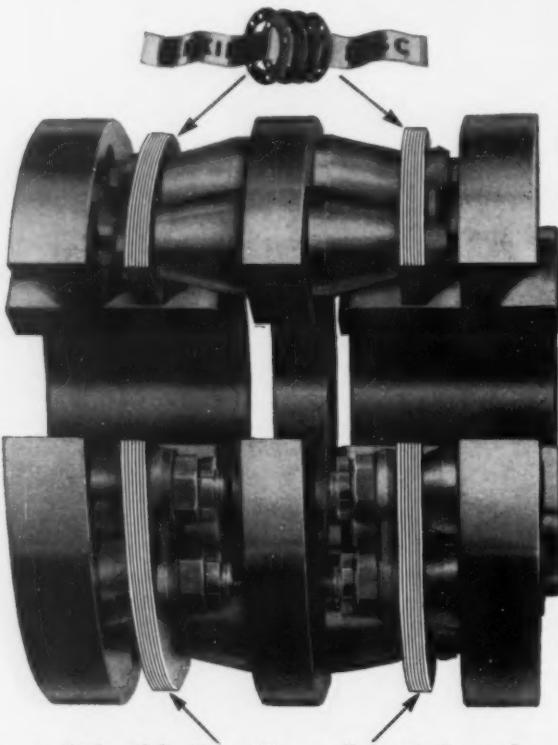
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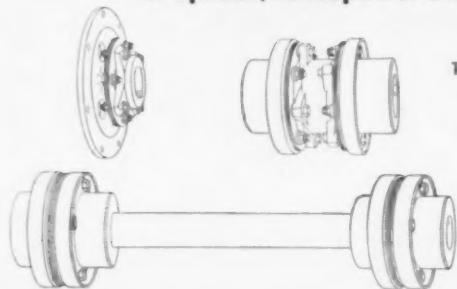
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NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



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Transportation

Waterways:

Steel expansion continues to hug the inland waterways.

U. S. expansion of steel mills, blast furnaces and coke ovens is following the inland waterways as the lure of low-cost water transportation appears to have lost little of the glitter it has always had in the past.

So says Chester C. Thompson, president of The American Waterways Operators, in reporting that 191 steel mills, blast furnaces and coke plants were directly on the inland waterways while only 96 are located elsewhere. Water transportation also carries raw materials, fuel and products for most if not all of the 96 plants not immediately on the waterways, he added.

Most Near Water

Of the 27 steelmaking states, only three—Colorado, Oklahoma and Utah—do not own inland waterways. Utah is the only coke-producing state out of 16 without water transportation, the report stated.

Blast furnaces in 18 states produce pig iron and ferroalloys. Only Colorado and Utah are without inland waterway transport in this group.

Steel capacity in the 24 states with inland waterways increased by 8,479,000 tons last year, while the three steel states not on inland waterways increased their capacity by 240,000 tons of ingots and steel for castings, Mr. Thompson pointed out.

Raise Output

Last year 92 steel plants on inland waterways hiked capacity by 7,377,700 tons. The 51 mills not directly on navigable rivers, canals and lakes raised their capacity by 1,482,100 tons.

The steel industry closed 1952 with a total capacity of 117,547,470 tons. Total capacity of mills on the waterways was 85,246,090 tons, while that of mills off the waterways was 32,301,380 tons, the study concluded.

FURNACES: Electrics vs. Openhearts

Utilities, coal industry sponsor Battelle study of comparative steelmaking costs . . . Electric shops need less capital . . . But operating costs vary—By J. B. Delaney.

Economics of low-carbon steel production in openhearth versus electric furnaces are discussed in a report based on a 2-year study sponsored by 14 electric utility companies and Bituminous Coal Research, Inc.

Loaded with charts, graphs, and data obtained from steel producers, the 77-page study undoubtedly will spur considerable pro and con discussion in the industry. The report makes out a good case for the electric furnaces, but its sponsors have no illusions that steel producers will start tearing out openhearts.

Strive For Fairness

The electric utilities and the coal producers admittedly had a selfish motive in making the study. Electric furnaces mean increased sales of electric power, hence higher demand for coal for generating purposes.

Nonetheless, the report is factual and, if anything, leans over backward to present a fair evaluation of the two steelmaking methods. The study was passed upon by rep-

resentatives of three steel companies.

Information found in the report includes:

1—Capital investment in an electric furnace shop is lower than in an openhearth shop of comparable size: \$6.7 million versus \$11.7 million for 250,000 tons annual capacity; \$10.5 million versus \$16.9 million for 500,000 tons annual capacity, and \$15.9 million versus \$26.6 million for 1 million tons annual capacity. Estimates are based on 1952 price levels.

2—On basis of cold charge, a 250,000-ton electric furnace shop will produce a ton of ingots \$3.20 cheaper than with a comparable openhearth shop; \$3.15 per ton cheaper in a 500,000-ton shop, and \$2.67 cheaper in a million-ton shop.

3—On basis of a 50 pct hot metal, 50 pct scrap charge, the openhearth shop is more economical. In a 500,000-ton shop, openhearth costs are \$1.10 per ton less than electric furnace costs, and in a million-ton shop, \$1.31 per ton less. No comparison was made for the 250,000-ton shop on basis of

50-50 scrap and hot metal charge.

4—If large-scale expansion of basic electric furnace steelmaking should take place in the future, "the process would of necessity have to be based on a hot-metal, cold-scrap practice, in order to maintain a proper balance between available scrap and pig iron."

Pros & Cons

The report points out that experience with hot metal charge in electric furnace is sketchy and unreliable. For this reason, the researchers estimated power and electrode costs for 50 pct hot metal on the high side. Improvements in electric furnace technology could reduce power and electrode consumption sufficiently to offset the cost differential favoring openhearts as indicated in present calculations, according to a statement in the report.

The study also asserts that electric furnaces are more flexible, can be put into production and withdrawn more readily than openhearts; that over a year, "down" time of an electric furnace is 15 days compared with 30 days for an openhearth; that electric yield is about 2 pct greater than openhearth for the same amount of materials; that electrics provide greater control of sulphur, better temperature control, better heat time.

Openhearth, Electric Furnace Steelmaking Costs Compared

NON-INTEGRATED PLANTS	Open-Hearth Plants of Indicated Annual Capacity			Electric-Furnace Plants of Indicated Annual Capacity		
	250,000 tons of Ingots	500,000 tons of Ingots	1,000,000 tons of Ingots	250,000 tons of Ingots	500,000 tons of Ingots	1,000,000 tons of Ingots
Cost of metallics (Less recoverable scrap)	\$46.65	\$46.65	\$46.65	\$42.95	\$42.95	\$42.95
Cost above	18.09	16.52	15.23	18.59	17.07	16.26
Production costs per ton of ingots	64.74	63.17	61.88	61.54	60.02	59.21
Difference in steelmaking costs for equivalent plant capacity				-3.20	-3.15	-2.67
INTEGRATED PLANTS						
Cost of metallics (Less recoverable scrap)		\$41.08	\$41.08		\$40.18	\$40.18
Cost above		13.95	12.93		15.95	15.14
Production costs per ton of ingots		55.03	54.01		56.13	55.32
Difference in costs for equivalent plant capacity					+1.10	+1.31

NOTE: Materials and labor costs are at 1952 levels.
Source: Bituminous Coal Research, Inc.



GM FIRE: Will Alter Plant Layout

Fire at GM Transmission plant will force changes in industrial design . . . More firewalls, size limits, wider space between buildings expected—By R. D. Raddant.

Repercussions of the plant fire at General Motors' Detroit Transmission plant, at Livonia, will be felt for months in many industrial fields.

Shut down of this single source of Hydramatic transmissions was felt immediately in the auto market, the steel market, and the entire machine tool world, as GM sought to repair or replace more than 5000 machines. Influence extended even to the labor and political fronts.

But its most lasting effect will probably be on design of future industrial plants and may even cause changes in expansion plans now being completed.

Plants Will Change

Confidential interviews with prominent industrial architects resulted in these conclusions:

1. There will be greater emphasis on firewalls in industrial archi-

tecture as a result of a pressure from fire inspectors and through new building codes.



ROUGH APPRAISAL of damage is carried on at Detroit Transmission plant site by GM tool experts.

2. Attempts will be made to limit the size of single industrial buildings.

3. Wider spaces between buildings may be specified by law.

Industrial architects are frank to admit that the Detroit Transmission fire may have a broader effect on plant design than any happening in recent years.

Do Firewalls Help?

If architects' predictions are carried through, it could mean the end of the buildings that cover millions of square feet of floor space without a single wall. This type of building has become standard in the auto and other industries where wide spaces are needed to meet changing demands made by rapid revisions of manufacturing layouts. Today's auto plants are not constructed for only one type of manufacture. They have to be versatile enough to handle many kinds of production.

The practicality of numerous firewalls is frequently questioned since they stop the spread of fire only if they are contained units, each cut off from the rest of the building.

Change Automaking Methods

Actually, modern industrial buildings, even without firewalls, are equipped to contain a fire within a small area, where it can be quenched without endangering life or much equipment. It was failure to contain the Detroit Transmission fire that led to the series of explosions that spread the fire more than 1200 ft in a few minutes.

Numerous firewalls would almost prohibit current manufacturing techniques of the auto industry which require wide spaces. New techniques are developed each year that demand revisions of conveyor lines, changes in methods, and other adaptations that could not be made in a plant cut into a maze by walls and small chambers.

As Safe as Can Be

Previously, no one has considered the bigness of a plant a hazard. The giant Willow Run plant

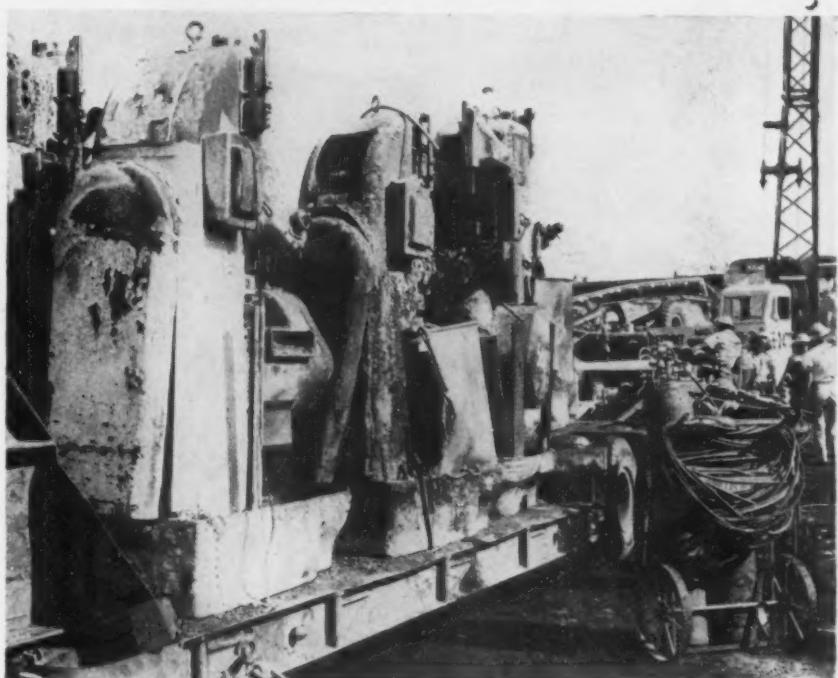
is 6½ million sq ft. The Ford jet engine plant near Chicago is close to 6 million sq ft. Detroit Transmission plant itself stretched 1½ million sq ft.

Most architects will probably agree that with or without fire walls, the modern industrial plant, large or small, is as nearly fireproof as it can be. The weak points in fire prevention are the human element and the processes carried on inside plants.

Fireproof—But It Burned

Probably no architect can adequately explain how a building, such as the Detroit Transmission plant, made of steel, concrete, glass and fireproof insulation can burn to the ground. As one prominent architect told *THE IRON AGE*: "If you had asked me 2 weeks ago what was in that building that could burn, I would have said there was nothing."

But the explosions set off by the original small fire, which reached lines and tanks of inflammable liquids, generated such heat that materials that normally would resist combustion actually burned. Paint, pitch and tar, even insula-



SOME CAME THROUGH in good enough shape to be moved directly to Willow Run, where GM has leased space from Kaiser. But other machines must be entirely rebuilt, a few scrapped. Tools being lifted out by cranes were generally the worst damaged.

tion helped spread the fire. Hot steel girders crumpled and twisted when jets of water hit them.

As nearly as possible, the Detroit Transmission plant was fireproof. Nevertheless it burned.

The same thing happened more than a year ago when the Ford tank plant, then still under construction, burned despite the fact that only paint and construction materials were inside the plant.

The conclusion is that no building is more fireproof than the activities or processes that are carried on inside it. If a fire gets hot enough, the building will burn. Firewalls won't contain a fire if lines carrying inflammable liquids pass through them. Few fires cause significant damage if they are contained in a small area, but it takes the right equipment used in the right way to keep them under control.

No matter how good the equipment, it's worthless or worse if employees aren't properly trained to use it. One fire insurance company estimates that 95 pct of all U. S. workers have never used a fire extinguisher nor seen one demonstrated.

Training is just one part of the overall job of fire prevention. Equally important are proper supervision and inspection of equipment and men. Like other aspects of safety, it is a prime management responsibility.



ROUND THE CLOCK salvage operations testified to GM's determination to get back in production as soon as possible. By 4:00 p.m. Friday, Aug. 21, 2363 pieces of machinery had been removed from the ruined plant, 1257 shipped back to the manufacturers for rebuilding.



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Fuel

COKE: Bethlehem

Battery of 80 byproduct ovens adds 1300 tons daily coke output, boosts chemicals yield.

First push of coke tumbled from a newly completed battery of 80 byproduct ovens at Bethlehem Steel Co.'s Bethlehem plant last week. The new battery, first to be installed at Bethlehem since 1916, will add 1300 tons to the daily output of the four existing batteries. This will give the plant an annual coke production of 2.3 million tons.

Battery Completely Equipped

Coke from the new battery will be used to feed the new "D" blast furnace, lighted off last March, and the planned "B" furnace, construction of which is scheduled to start soon. The additional metal from the new furnaces plus increases in openhearth output resulting from better fuels through coke oven gas conditioning will boost plant ingot capacity by about 15 pct.

The new ovens, designed and built by Koppers, are of the most modern design. The battery is completely equipped with subsidiary facilities, including quenching tower and car, byproducts plant and handling equipment.

Ovens Are Larger

At peak operation the battery will raise the number of ovens pushed every 24 hours to 645, an increase of 117 ovens over the number previously pushed.

Another factor in the increase is the larger size of the new ovens. Of the horizontal flue type, they are each 39 ft 2 in. long and 12 ft 6 in. high, inside, taking a coal charge of 15.2 tons. Average on the other batteries is 12.01 tons. Coke production of No. 5 battery will be 11.05 tons; on the older ovens the average for the four batteries is 8.81 tons.

Boost Chemical Output

In the coking process about 1.37 tons of coal is required to make

Pushes New Ovens

one ton of coke. On this basis, Bethlehem's coke division will use 8250 tons of coal (approximately 165 cars) daily to produce the expected 6300 tons of coke.

Output of coal chemicals will also be increased when the new ovens are in full operation. Daily coal tar production will rise to 57,750 gallons, ammonium sulphate to 75 tons. Light oil will hit 24,750 gallons, yielding 17,325 gallons of benzol, 2800 gallons of toluol and 1000 gallons of xylol. Naphthalene output will be 3300 gallons daily.

To handle these a complete new gas conditioning and coal chemical plant, representing a 25 pct increase in total equipment, has been constructed and equipped as an adjunct to the new coke oven battery. Equipment installed includes primary cooler, centrifugal exhaust pump to pull the gas off the ovens, electric precipitators to clean gas of tar particles, saturator to remove ammonium sulphate, final cooler, benzol scrubber to remove hydrocarbons, a light oil still, continuous benzol refining facilities, naphthalene recovery plant, and gas desulphurizing unit.



FORGING a 110-ft, 145-ton column section for a 50,000-ton press at Bethlehem Steel Co., Bethlehem. Press is being built for the Air Force by Loewy Construction Co., New York.



How to **tame corrosion fast and effectively on welded joints**

Chemical tanks and equipment must have more than the proverbial nine lives to withstand incessant corrosive attack.

Proper plate material and good joint design are basic. The choice of the right electrode in some cases may be relatively easy—but always highly important. In other cases, where the corrosive action is intensified by heat and perhaps pressure, the proper balance of the chemical, physical and metallurgical properties in the weld metal will be critical.

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FOUNDRIES: May Start Up in Northwest

First iron production in Northwest in over 50 years buoys hopes that a small smelting industry can be started . . . Cheap power an important factor—By T. M. Rohan.

Recent production of 10 tons of pig iron at Albany, Ore., the first important output of basic iron in the Northwest since 1896, revives hopes that a small, self-sufficient iron smelting industry may yet be established in the area.

The pig iron was produced from local ores by the U. S. Bureau of Mines after 5 years of experimentation. Using a combination of low-grade local limonite ores from a deposit known as Scappoose, and waste wood and raw coal as reductants, the metal was produced by electric smelting for a local foundry.

Can Get More Ore

Known ore reserves in the area are only about 3-4 million tons, not enough to cause any concern in Pittsburgh and Chicago, but the combination of the Pacific Northwest's low-cost power and abundance of waste wood which can be used instead of coke as a reductant might enable a small local industry to operate at low cost.

In addition, ore from Vancouver, B. C., most of which is now being shipped to Japan, could supplement the area's limited ore

sources to a considerable degree.

In the first run of metal turned out by the Bureau of Mines' Northwest Electrodevelopment staff, a cupola mix of 500 lb of Scappoose pig iron, 500 lb of steel rails and 200 lb of purchased gray iron scrap was used.

Although a cautious local foundryman used the metal for counterweights, lab tests indicated higher caliber properties and subsequently gear housings and friction plates were cast.

Use for Soil Pipe

Due to the local scrap surplus and relatively high cost of pig, the Scappoose pig was purposely made high in silicon content so the cupola could accommodate a high scrap charge.

Phosphorous content of the pig was about 1.25 pct—too high for steelmaking but ideal for thin section castings such as soil pipe and radiators which need good flow characteristics.

Use of hogged wood rather than coke as a reductant was major development in the project because it points to possible future use of the vast supplies of waste wood available in the local lumber country. Inside the furnace, the



TOP VIEW of the electric smelting furnace as seen from the charging deck.

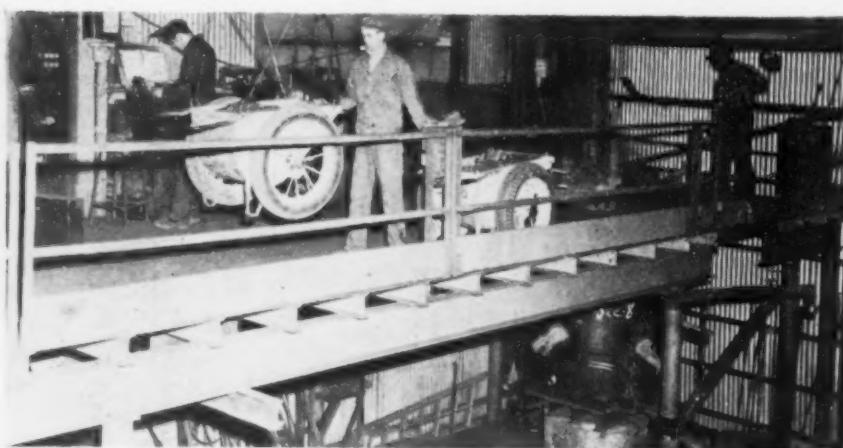
wood keeps the charge open, allowing gases to escape which eliminates the need for agglomeration.

Production of the metal is believed to be the first in the Pacific Northwest since the closing of the Oswego Iron Co., near Portland in 1896. This firm and its forerunners turned out a total of 91,250 tons of pig and cast iron for water pipe in Portland and foundries in San Francisco until production costs forced the shutdown.

Ore Use Limited

Only present use of local ores is for sienna and ochre paint pigment and some chemical iron oxide production.

Most recent official exploration of the area's deposit was made during the World War II scramble for raw materials. Bureau of Mines reported at the time that there were 4 million long tons of 39.1 pct Scappoose ores, nearly all of which could be mined by inexpensive open-pit methods. Property owners, however, maintain that the bureau overlooked the larger underground deposits of 50 to 54 pct ore.



WORKERS PREPARE to charge electric smelting furnace to produce the Pacific Northwest's first basic iron since 1896. Iron ore from local Scappoose deposit was used.

STEEL: Threefold Growth in 3 Years

Little Granite City Steel comes of age . . . Gross property holdings jump from \$30 million in '50 to \$95 million in '53 . . . New roughing mill nears completion—By K. W. Bennett.

"Little" Granite City Steel is no longer little. Last week the Granite City, Ill., mill sprouted another couple inches of growth as it moved into the final phases of its \$68 million post-war expansion program with a report that its new 7000-hp roughing mill, rated at about 250 tons an hour, was nearing completion.

Not only has Granite City Steel come into manhood in the steel industry but its new productive capacity is fully employed. The company has increased its gross property holdings from \$30 million in 1950 to a whopping \$95 million in 1953 with the bulk of this output aimed at the flat-rolled, low carbon steel market. Addition of three 300-ton openhearts, currently the largest in the Midwest, has hiked annual net ingot tonnage capacity to 1.2 million tons.

Red Letter Year

Still waiting completion, and scheduled for use early next year, is a new shipping dock that will improve the company's location for advantageous water shipment, although rail shipments will still handle the bulk of Granite City's steel shipments.

This has been a red letter year for Granite City. In nearly every month new capacity has been brought in. In March a new shear line was ready for work. In April the new bloomer was brought in, went to work after a break-in period short enough to set most steel men's hair on end. With the bloomer, six 3-hole batteries of soaking pits, handling 100 tons, came in to replace old pits estimated at 60 tons capacity.

On May 27, entry of the new No. 2 battery of coke ovens brought the company's coke producing capacity to 450,000 tons made the mill self-sufficient. Granite City had purchased 49 ovens from the Koppers Company in

1951. These are rated at 310,000 tons per year.

Roll Light Plate

In May, the first of the new 300 ton openhearts was ready for work. A second was reported in on June 16, and the third was fired, appropriately enough, on July 4.

In early September the revamped hot strip mill will be back on the job and customers can expect some rollings of light plate in the fourth quarter.

With all its expansion, Granite City will remain primarily in the low carbon steelmaking field. Because of relatively low capital investment inherent in installation of some types of electric furnace, a number of firms in cheap power areas are now producing electric furnace steel.

Since alloy steel demand in Granite City's market area would have required some bar producing capacity, the company, aware of its traditional position of low carbon producer, felt the outlay of money and the hike in personnel and rolling equipment would not justify a switch of part of its steelmaking capacity.

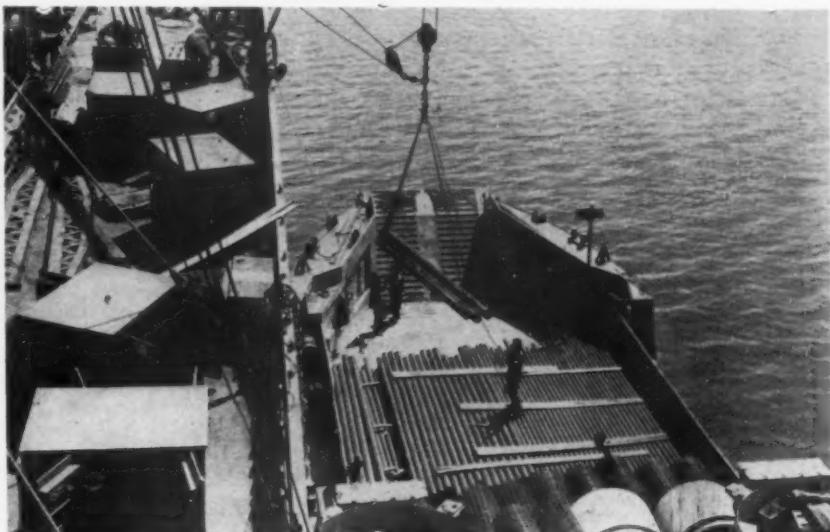
Similarly, the company seems to be well stocked with long-term customers needing quantities of low carbon in the same analysis. This justifies the larger melts now available with its 300-ton openhearth equipment.

While Granite City has doubled its output and upped its equipment roster by almost two-thirds since 1950, the company is not yet ready to call it a day. Several of the long-term thinkers have their eye on South American ore deposits which could be barged up the Mississippi at low cost. The new dock would figure into this program.

The new openhearth capacity will reduce Granite City's surplus pig iron capacity considerably. The company has offered pig iron for sale in the Mississippi area. With nine of its original 65-ton capacity openhearts still in operation, Granite City has no plans to put them out of action in view of present demand for their products.

The older furnaces do represent a higher-cost operation, and in the event of a considerable cutback in steel demand would be classed as marginal.

But Granite City seems to have called the turn well, has a number of products that seem guaranteed a firm market. Notable is light plate, which has been increasingly tight in the past 2 months with no indication of a letup in the near future.



PIPE IS UNLOADED from *Winfield S. Stratton* into an LCT in a harbor near Newfoundland.



Watchbirds—Flying Radar Stations

This pot-bellied, hump-backed airplane with a Durante nose will be a watchbird for American security against aerial and ocean invaders. Really a flying radar station, it will beam search rays over greater distances than have ever been possible. Radar rays from ground stations are limited by their inability to bend over the horizon. Maximum efficiency is possible when the radar's airborne.

Guts of the reconnaissance scout are 6 tons of radar and electronic equipment, built into a Super Constellation transport for long range and high altitude. The radar sentry is produced for Air Force and Navy by Lockheed Aircraft Corp., Burbank, Calif.

Housed in the sharklike "fin" on the plane's back, in the inverted plastic dome on its underbelly, and in the elongated nose will be ultra-sensitive radar antennae. The plane is equipped to carry up to 31 crewmen, including relief pilots, radar officers, technicians and maintenance specialists and can go on long coastal patrols or serve Navy fleets from land bases as "eyes" against the enemy.

Although high speed is not an important factor, the planes, called RC-121Cs by the Air Force, Wv-2s by the Navy, will haul their weighty equipment at maximum cruising speeds of 335 mph. Power is furnished by four 3250-hp Wright turbo-compound engines. Tiptanks will provide extra fuel.

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Shell 90mm, 1075000, \$290,909 increase, United States Steel Co., Pittsburgh, *G. M. Hultz*.

Drive unit, 32, \$354,700, Vickers, Inc., Detroit, *R. M. McCabe*.

Nozzle diaphragm, 22, \$60,970, General Electric Co., Washington, D. C.

Generator set, Diesel engine driven, 21, \$282,200, General Motors Corp., Detroit, *J. E. McKenna*.

Dead reckoning tracer, 25, \$221,625, S. P. Seeburg Corp., Chicago.

Dead reckoning analyzer, 47, \$292,943, Arma Corp., Brooklyn, N. Y.

Crawler tractors, job, \$123,321, International Harvester Export Co., Chicago.

Crawler tractors, job, \$69,543, The Osgood Co., Marion, Ohio.

Blower, exhaust, 696, \$215,285, Wittie Blower Co., Chicago.

Truck-aircraft, 1597, \$141,330, Hammond Manufacturing Co., Pasadena, Calif.

Maintenance parts for AD aircraft, var, \$182,364, Douglas Aircraft Co., Inc., El Segundo, Calif.

Maintenance parts used on strut assys, var, \$97,824, Bendix Aviation Corp., South Bend, Ind., *G. I. Lyman*.

Maintenance parts, var, \$60,520, Borg-Warner Corp., Bedford, Ohio, *Ralph Freeman*.

Pump assy for var aircraft, var, \$529, 189, Borg-Warner Corp., Bedford, Ohio, *Ralph Freeman*.

Valves for var aircraft, var, \$333,034, Weston Hydraulic, Ltd., N. Hollywood, Calif.

Post test used on HSD propellers, 134 ea, \$54,806, United Aircraft Corp., Windsor Locks, Conn.

Post test used on HSD propellers, 154 ea, \$56,272, United Aircraft Corp., Windsor Locks, Conn.

Material for P&W engines, var, \$84,234, United Aircraft Corp., Windsor Locks, Conn.

Spare parts for P&W engines, var, \$159,907, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Spare parts for P&W engines, var, \$608,943, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Spare parts for P&W engines, var, \$284,470, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Spare parts as used on HSD propellers, 180 ea, \$102,060, United Aircraft Corp., Windsor Locks, Conn.

Material for P&W R2800 engines, var, \$349,997, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Spare parts for P&W engines, 5074 ea, \$60,634, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Aircraft rocket launcher, 40000, \$1,820, 737, Century Industries Co., San Pedro, Calif.

Aircraft rocket launcher packages, 40000, \$1,692,000, The Spra-Con Co., Chicago.

Aircraft rocket launcher package, 40000 \$1,557,600, Radiant Mfg. Corp., Chicago.

Vaneaxial fan, 102, \$93,151, Joy Mfg.

Co., New Philadelphia, Ohio.
Gages, inspection for 155 mm gun M1A1, 8, \$59,030, Pratt & Whitney Div., Niles-Bement-Pond Co., West Hartford, Conn.
Replenishment of hardware, 10000, \$189,000, Sun Electric Corp., Chicago.
Replenishment of commercial vehicle parts, 125, \$68,187, The Barr Rubber Prod. Co., Sandusky, Ohio.

Accounting:

Work on new bookkeeping system for Defense Dept.

Modernized accounting practices may be provided for the Defense Dept. as early as mid-1954 if a new 12-member survey committee made up of businessmen and government officials can complete its job by that time.

Heading the new Advisory Committee on Fiscal Organization and Procedures is Charles P. Cooper, former vice-president and director of American Telephone and Telegraph Co. and president of Presbyterian Hospital, New York. His group will try to bring together the best features of new accounting methods for incorporation into Defense Dept. fiscal control operations.

Use Dollar System

As he took the job of panel chairman, Mr. Cooper said that the task of altering bookkeeping procedures in an agency which will spend more than \$40 billion this year is a "tremendous job."

He warned of the danger of wasting money in an attempt to keep track of every penny. This view possibly indicates the committee will weigh the merits of the whole-dollar system of cost accounting, adopted this year by the Post Office Dept. as an economy measure.

Defense Secretary Charles E. Wilson, who appointed the new group, declined to predict a precise date for completion of the survey, though he said he hopes it may be finished by July 1.

The method of presenting planned budgets to Congress will not be changed, Mr. Wilson said, though monetary totals may be added up differently. He forecast, instead, that the survey may make it possible to give Congress and the public a more accurate picture of what is done with appropriations.

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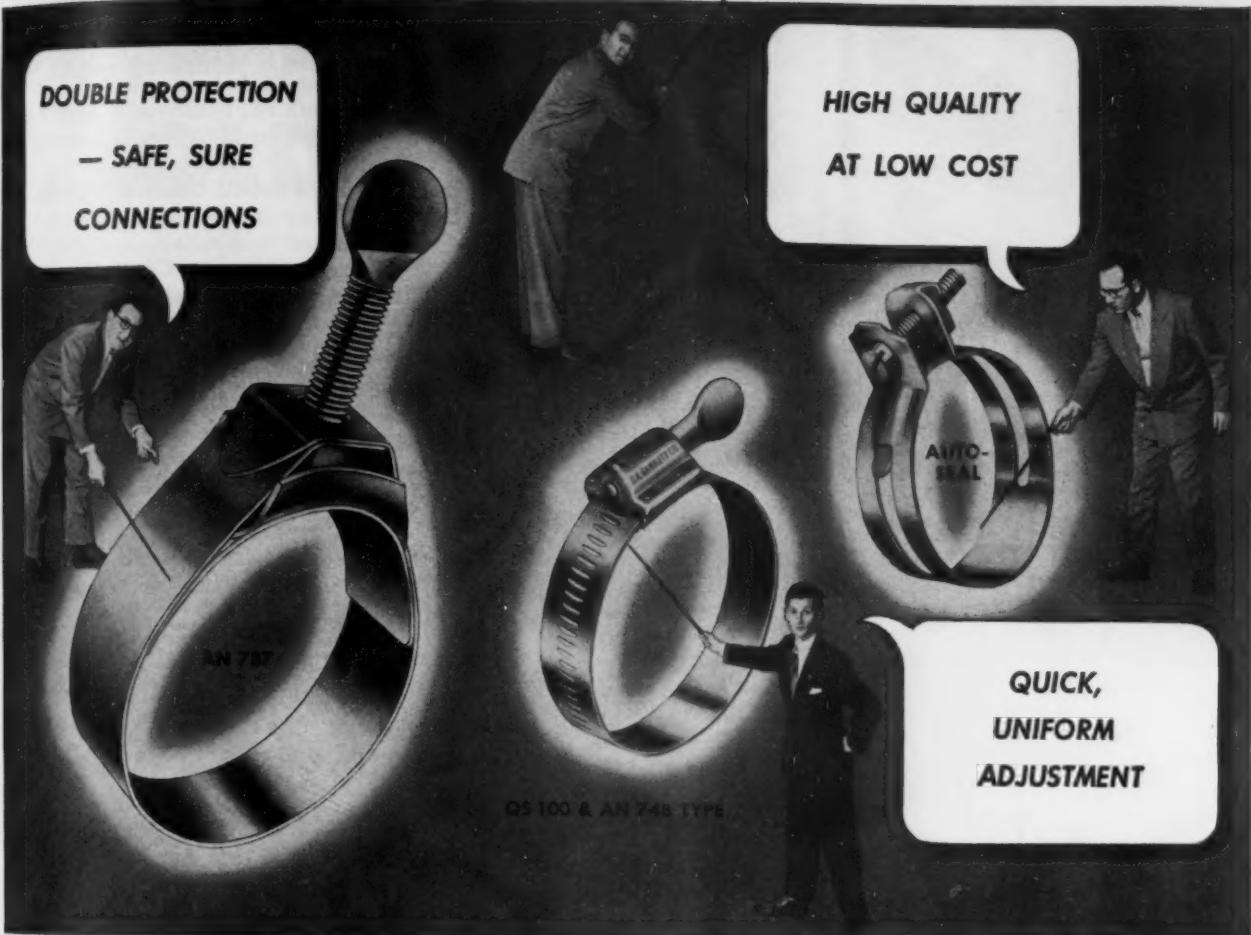
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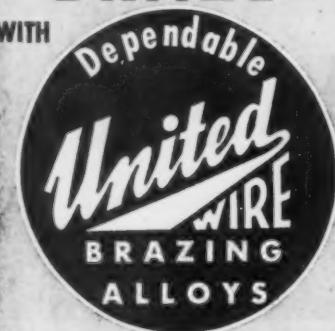
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Industrial Briefs

Exhibit Highlight . . . BECKMAN INSTRUMENTS, INC., South Pasadena, Calif., will exhibit a recording spectrophotometer which automatically runs more samples in 1 hour than an operator could all day at the Eighth National Instrument Society of America Show in Chicago, Sept. 21-25.

Order Placed . . . GREENVILLE STEEL CAR CO., Greenville, Pa., a subsidiary of Pittsburgh Forgings Co., has just received an order for 300 70-ton mill-type steel gondola cars from the Erie R.R. Co.

Controlling Interest . . . THE CHAIN BELT CO., Milwaukee, has purchased a controlling interest in Crothers Engineering Ltd., an affiliate of George W. Crothers Ltd. The new company will be known as Canadian Chain Belt Ltd.

Coming Up . . . AMERICAN SOCIETY FOR QUALITY CONTROL will hold its Eighth Midwest Conference in the Masonic Temple at Davenport, Iowa, on Oct. 8-9.

Sworn In . . . Harry L. Smith, Jr., staff manager of product sales, ALUMINUM CO. OF AMERICA, was sworn in as director of the Aluminum Div. of National Production Authority, U. S. Dept. of Commerce, Washington, recently.

Enlarging Battery Plant . . . Delco-Remy Div., GENERAL MOTORS CORP., is enlarging its present auto storage battery plant in New Brunswick, N. J. Design and construction is being handled by Wigton-Abbott Corp., Plainfield, N. J.

Scholarship Funds . . . NATIONAL MALLEABLE & STEEL CASTINGS CO., is establishing \$3000 in scholarship funds this year at six educational institutions.

Expanded Quarters . . . A. O. SMITH CORP., Milwaukee, has transferred the manufacture of its newly-designed line of ac and dc welders by the Welding Products Div. to expanded quarters at Elkhorn, Wis.

Awarded . . . ILLINOIS INSTITUTE OF TECHNOLOGY has awarded Michael Schneider, Chicago, a scholarship established recently by the American Society for Metals Foundation for Education and Research.

Sales Office . . . INTERSTATE STEEL CO., Evanston, Ill., has established an Indiana sales office at 132 E. 30th St., Indianapolis, to be headed by Lawrence W. Schellhammer.

New Lab . . . PITTSBURGH PLATE GLASS CO.'s Forbes Finishes Div. has started construction on a new laboratory building in Cleveland adjoining the division's administration office building at 3800 W. 143rd St.

Almost Ready . . . ATLAS STEELS LTD., Welland, Ont., is completing installation of its stainless steel cold-rolled strip and tubing mill. It will go into production during fourth quarter.

Agreement . . . INLAND STEEL CO. and Local 5000 of the United Steelworkers have agreed on a contract covering seamen on vessels of the Inland ore fleet. It provides an 8½¢ per hour wage increase retroactive to June 12, 1953.

Vote of Thanks . . . THE FRANKLIN INSTITUTE, Philadelphia, will award Dr. Robert F. Mehl, director of the Metals Research Laboratories and Professor of Metallurgy, Carnegie Institute of Technology, the Francis J. Clamer Medal at its formal Medal Day ceremonies, Oct. 21, for "his numerous useful contributions in the fields of theoretical and applied metallurgy."

Research Program . . . THE INDIANA STEEL PRODUCTS CO., Valparaiso, Ind., has been selected by the U. S. Air Force for a contract sponsored by the Wright Air Development Center of the Air Research & Development Command to conduct a comprehensive research program on magnetics to improve military air and ground devices using magnets.

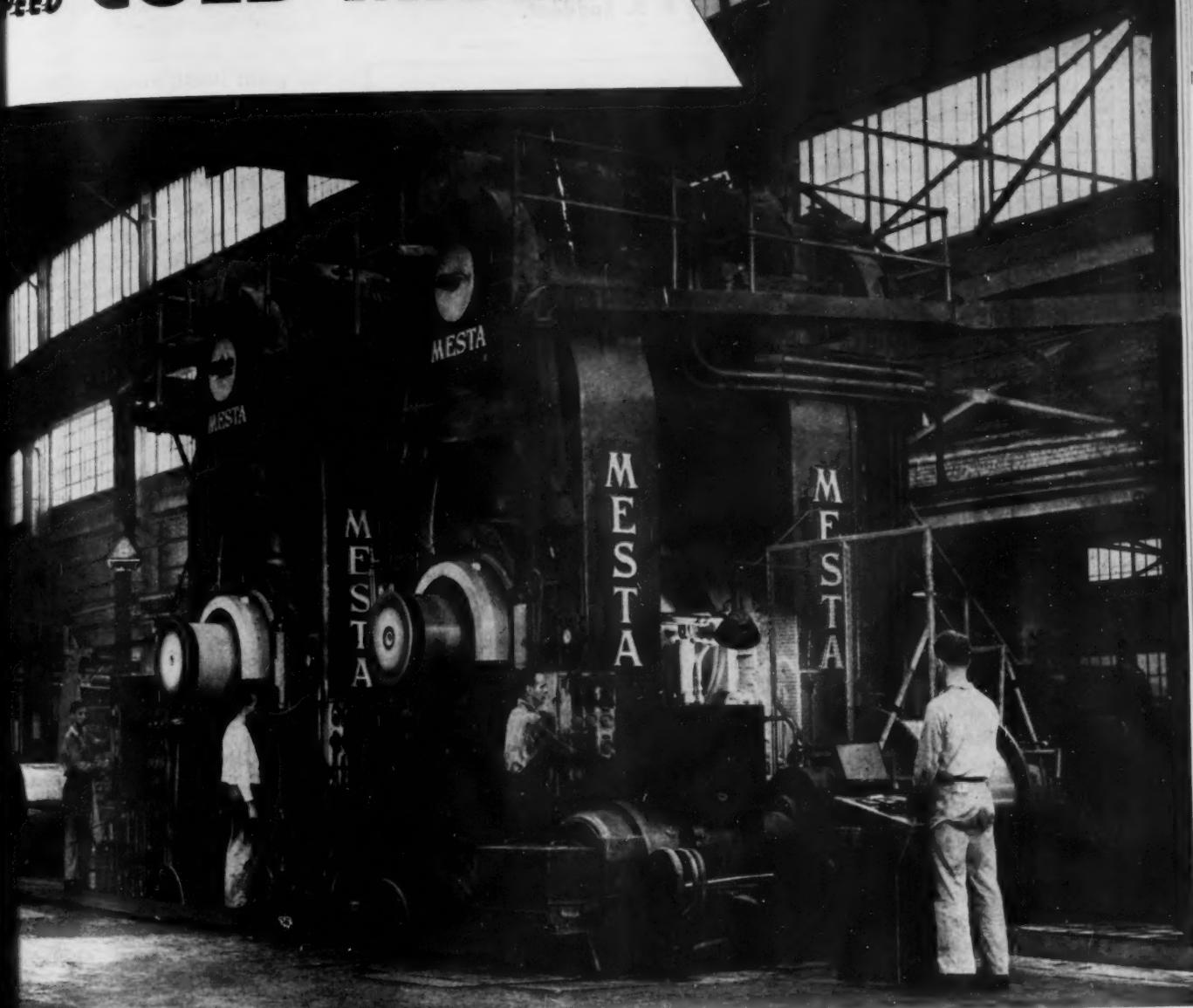
Elected . . . Dr. George P. Swift, Waltham, Mass., was elected national president of the AMERICAN ELECTROPLATERS SOCIETY recently.

Steelmaking . . . H. G. Hilton, president of the STEEL CO. OF CANADA LTD., sees Canadian steel production for 1953 amounting to more than 4 million tons.

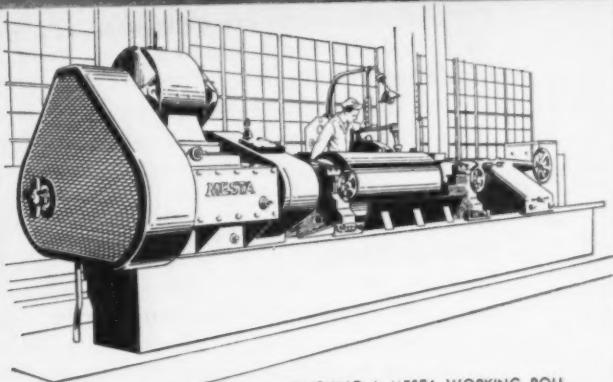
Dividend . . . THE BRISTOL BRASS CORP. has declared a dividend of 35¢ per share on its common stock.

MESTA

HIGH-SPEED COLD MILLS



A 42" FOUR-HIGH, TWIN-STAND HIGH-SPEED SKIN PASS MILL
INSTALLED IN A LARGE EASTERN STEEL PLANT.



FINISHING A MESTA WORKING ROLL
IN A MESTA HEAVY DUTY ROLL GRINDER

Designers and Builders of Complete Steel Plants
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PITTSBURGH, PENNSYLVANIA

The Automotive Assembly Line

GM to Resume Car Output Next Month

Increased output from other transmission lines will replace Hydramatic fire loss . . . Cadillac, Olds to shift to Dynaflow . . . Rush machinery repairs—By R. D. Raddant.

The production miracle by which General Motors was expected to gain a hasty revival for its three fire-trapped divisions moved forward on two fronts last week.

It became apparent to GM's experts after one look at the fire-destroyed Detroit Transmission plant that in spite of all cooperation from the machine tool industry, repair and replacement of new tools was not the answer if any production was expected from Oldsmobile, Cadillac and Pontiac within a period of many weeks.

What GM Plans . . . The next logical step was to explore GM's working resources for Hydramatic transmission replacement possibilities. And within a week GM's short term answer was out.

Cadillac is to return to production Sept. 8 using the Twin Turbine Dynaflow borrowed from Buick. Oldsmobile will continue production until early September on syncromesh transmissions, then also augment its schedules with Dynaflow transmissions. Pontiac continues production of syncromesh transmissions, but early in September is scheduled to bring in the Powerglide transmission borrowed from Chevrolet.

But these measures are stopgap at best, and GM continues to concentrate on retooling for Hydramatic production and negotiations with Kaiser Motors for use of 1.5 million sq ft of the silent caverns of Willow Run.

Scoffers Wrong . . . Borrowing Dynaflow from Buick, incidentally, was one of the first possibilities raised after the fire. It was also one of the first discounted.

the country were pressed into service on repairing machinery from the plant or making new replacements.

At the plant site 32 cranes were in immediate action, lifting machinery from the ruins. Little attempt at inspection was made at the plant itself, except for setting aside machinery beyond repair.

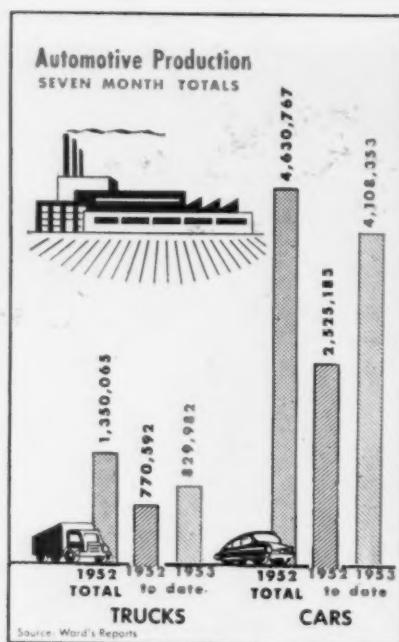
Tool Plants Busy . . . Estimates varied all over the lot on the state of repair of most machinery. Many needed only new wiring and electric motors. Others needed only grinding of warped or uneven surfaces. Carloads of damaged machines were on their way back to their home plants within hours of the start of salvage operations.

Some machine tool plants immediately went on 24-hour operations repairing and remodeling as well as building replacement tools. There was some talk of asking for government priority in view of the widespread unemployment that was expected to result. But GM's other plans appeared to make this out of the question.

Still the 64 dollar question was to what extent the substitute transmissions would supplement production. At Cadillac it was understood that about half the company's hourly rated employees were on the job at the end of last week.

Others Hurt . . . Actually, the Detroit Transmission fire will dominate the automotive picture for weeks to come, not only with GM divisions, but others which use Hydramatic transmissions.

Lincoln, a major outside user, immediately offered GM use of its spacious old plant from which it moved last year. GM chose to negotiate for Willow Run.



While GM and the affected divisions remained silent on this point, so-called informed sources blandly said the transmission could not be adapted and, even if it could, production of Dynaflows was scarcely enough for Buick, not to mention Olds and Cadillac.

The fact that these adaptations can be made in such a limited time is a tribute to GM's ingenuity. Not only will the assembly lines have to be revised, but some design modifications will have to be made on the cars. Furthermore, increasing production of Powerglide and Dynaflow transmissions to the point where it will be more than a trickle to the borrowing divisions is a problem of first magnitude.

Set Repair Deadline . . . Meanwhile, GM set a 6-weeks deadline on machinery repair from the burned plant. Practically all machine tool resources available in

Prices Affected . . . Hudson, which is to bring out a new model in September, is also dependent on Hydramatic for its automatic

Turn Page

THE IRON AGE

transmission. Nash, another non-GM user of Hydramatic, is also in the new model process, but may not be ready until facilities are restored.

Prices of new Cadillacs, Oldsmobiles and Pontiacs immediately went up on used car lots and trade-in allowances were curtailed by new car dealers who still had inventories of these three cars.

Trucks Need Friends . . . It's no secret that the truck manufacturers these days keep one eye on public sentiment. In recent years highway crowding and higher highway taxes have built up a resentment to trucks on the highway that manufacturers and truckers want to check.

This has resulted in serious attempts to keep road noise down, build up truck driver courtesy.

"Depop" Exhausts . . . One of the latest gimmicks is a "depopping" device developed for heavy-duty Ford trucks to eliminate loud exhaust noises when slowing down or going downgrade. This popping is characteristic of all heavy gasoline trucks when the engine is being pushed against a closed throttle.

With the new device in operation, the popping noise is eliminated by upsetting the idle fuel mixture with the throttle in a closed position to a point where it is not capable of supporting combustion.

Family Car Still Most Popular

In spite of all the emphasis on sporty styling this year, the backbone of auto production is still the family type, 4-door sedan.

Ward's Automotive Reports, which compiles statistics on almost everything automotive, points out that 51.2 pct of the production in the first half of 1953 was earmarked for the sedan.

Second on the popularity list is the 2-door sedan with 25.7 pct followed by the hardtop with 14.4 pct of all production. In the specialized models, the station

Automotive Production

(U. S. and Canada Combined)

	CARS	TRUCKS
Aug. 22, 1953 . . .	136,109*	27,460*
Aug. 15, 1953 . . .	131,098	25,428
Aug. 23, 1952 . . .	88,778	20,833
Aug. 16, 1952 . . .	25,923	10,967

*Estimated Source: *Ward's Reports*

wagon is ahead of the convertible with 4.6 and 3.2 pct respectively. The remainder of production is in business coupes, a practically negligible 0.7 pct, and 0.2 pct in chassis.

In terms of trends, the station wagon is up 80 pct from a year ago, indicating the popularity of the all-purpose unit.

Ford Foundry Wins Civic Award

Features of Ford's Cleveland foundry have received wide recognition throughout industry for mechanization as well as atmosphere control measures that make it probably the most modern in industry.

They also received some civic

recognition recently, indicating that good industrial practices are appreciated by more than the plant workers.

The foundry was singled out of the 75 factory buildings completed in Cleveland during 1951 and 1952 as the most outstanding in the large factory class in judging by the Cleveland Chamber of Commerce. The plant and auxiliary buildings were designed by F. A. Fairbrother and George H. Miehls, Architects & Engineers, with the Albert Kahn organization of Detroit as consultants.

Plan Industrial Relations Unit

A new industrial relations building will be the fifth unit to be constructed at the Ford Motor Co. Research & Engineering Center at Dearborn.

The new building will be started this fall and will augment the already completed dynamometer, maintenance, styling, and vehicles testing buildings.

The multi-million dollar center will not be completed until 1958.

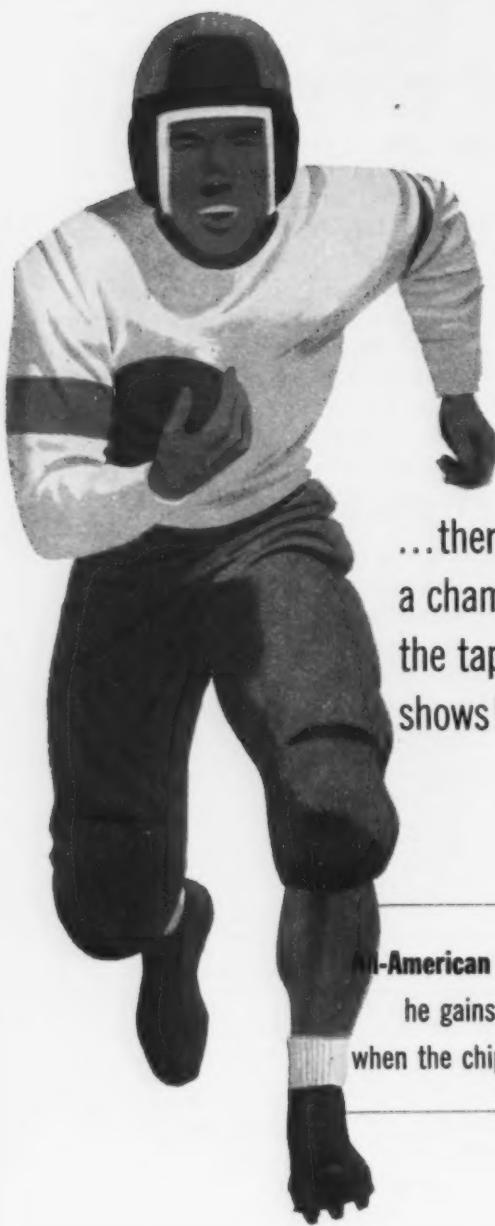
THE BULL OF THE WOODS

By J. R. Williams



IT'S PERFORMANCE THAT COUNTS

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...there's more to
a champion than
the tape measure
shows!

American Halfback . . .
he gains ground
when the chips are down.



Average Halfback . . .
he may measure
the same . . . but he's
stopped in the tough ones.

HARDTEM DIE BLOCKS* perform like "champions" in your production line!

Heppenstall Hardtem Die Blocks perform like "champions" because they possess those extras that result in superior quality. Their patented steel analysis

resists softening and heat checking in service. Records from plants using Hardtem Die Blocks provide the following benefits for production:

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- ★ Lower Overall Die Cost ★ Less Down Time
- ★ Holding of True Dimensions

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The most dependable name in die blocks



This Week in Washington

Pentagon Slow to Spend Tool Funds

Plans inventory first to find what is owned, what is needed . . . Tax drive brings delinquent revenue . . . Survey industry views on postal rates before action—By G. H. Baker.

The Pentagon is in no hurry to spend the \$250 million voted by Congress this year for purchase of machine tools and other productive machinery. Idea is to first complete a sound inventory of what defense plant facilities and tools the government already owns. Barring some unforeseen crisis in Defense Dept. mobilization plans, no part of the \$250 million kitty for tool-buying will be allotted until military planners have an accurate inventory of what's on hand and what's really needed.

Actually, the Pentagon is under no obligation to spend the entire \$250 million in this fiscal year. Authority to let contracts for purchase of tools is to be extended over the next several years. Decision as to whether or not to ask Congress next year for additional tool-buying funds has not yet been reached. It's entirely possible that Defense Dept. will ask Congress to vote a comparable sum again next year to be similarly earmarked for acquisition of defense plant and equipment, tools and machinery.

Paying Up . . . Federal drive against tax delinquents yields more extra revenue than the government had expected. Internal Revenue Service agents report a small "flood" of tax returns—and checks—pouring in from sections of New England and the Midwest. These two areas were selected to find out if business firms and individuals are paying their fair share.

Reports from field agents indicate that many delinquent returns are arriving at regional tax offices, along with the amounts due. About 2 pct of the tax-paying public cheats on its payments, revenue agents estimate.

Get Industry View . . . Whether or not postal rates are to be increased next year depends in part on a survey the National Industrial Conference Board is now making on the use of the mails by business firms.

Despite urgent pleas to Congress by the Eisenhower Administration for enactment of new and higher postal rates prior to adjournment, Senate and House members decided to postpone action on the request until they'd studied businessmen's side of the story.

Subject of higher rates on nearly every class of mail is to be the first order of business before the House Post Office Committee next January. Results of the NICB survey are to be made available to members of both the Senate and House Post Office committees.

Deduct Research? . . . Funds spent by industry for research and development should be deductible for tax purposes, business representatives tell congressional tax-writers.

Potential backers of industrial research projects are discouraged from such investments, under existing tax laws. But new jobs and new wealth would result, it is argued, if Congress would permit taxpayers to deduct such outlays in preparing their tax returns. At present, sums spent on research may be deducted only if the taxpayer's established method of accounting charges such costs to expense. New taxpayers and firms that want to shift their accounting procedures do not enjoy this advantage.

Making Jobs . . . Far from reducing number of jobs, increasing use of machinery in the electronics industry is creating a rising demand for skilled workers in the metals trades.

This trend is particularly building new demand for skilled workers in the tool and die making and the machinists fields, according to the Bureau of Apprenticeship of the U. S. Labor Dept.

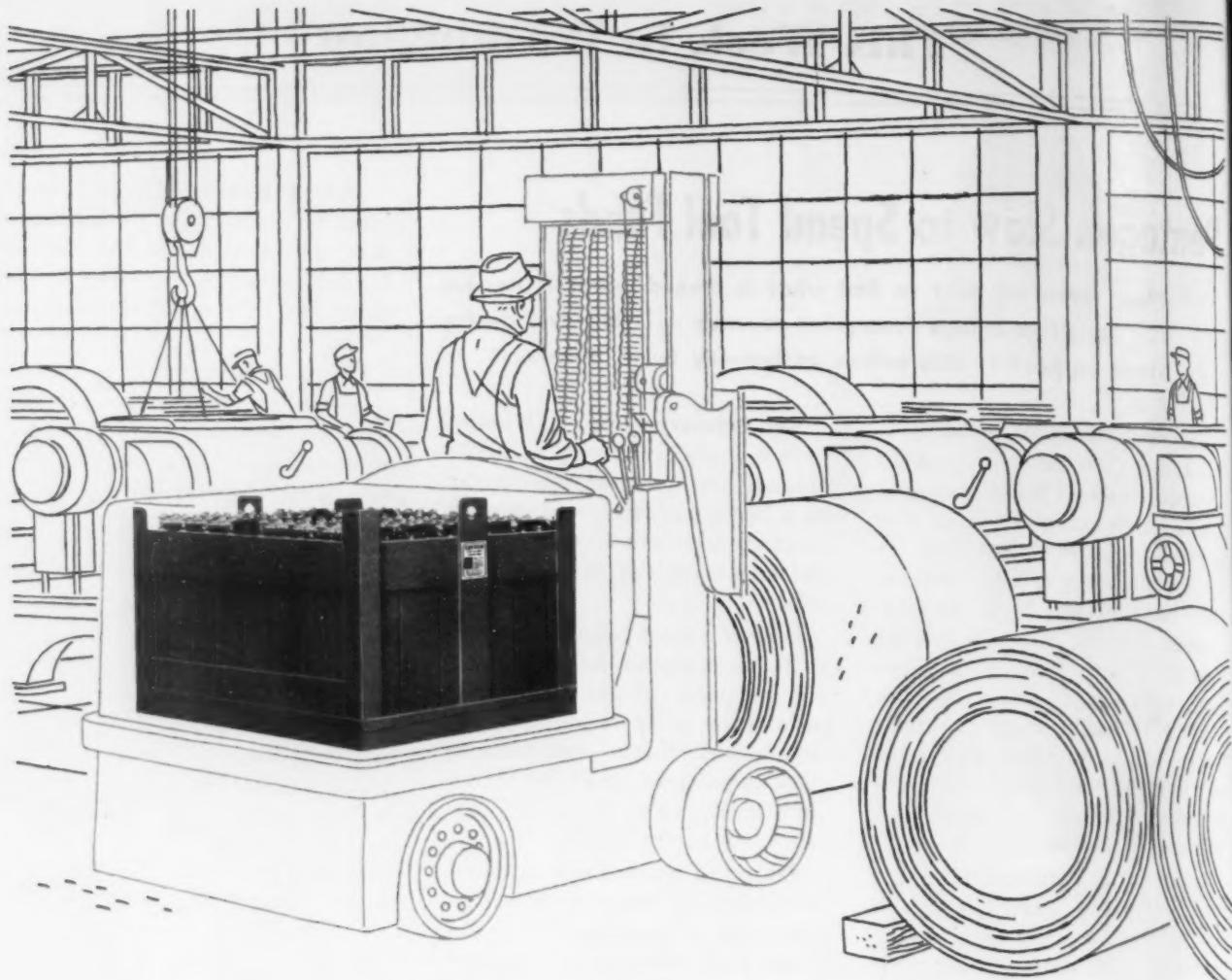
Although a substantial portion of these jobs in the electronics industry require only a short period of training, indications are that there will be a heavy demand over the next several years for craftsmen requiring longer training.

Paperwork . . . U. S. agencies have been instructed to make use, whenever possible, of a new standard 6-copy form for reducing time and paperwork in ordering materials, certifying receipt, and okaying bills for payment.

It is estimated by General Services Administration that the new form can be utilized in something like 6 million individual transactions.

Previously, about 50 different forms have been used. Use of the





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EASILY EXCHANGED—QUICKLY RECHARGED—DOUBLY DEPENDABLE

When duty cycles for industrial trucks are longest and toughest, the *extra* advantages of EDISON batteries often become the *most essential*. Then, more than ever, EDISON batteries deliver the greatest value at any price.

In rugged 24-hour truck service, they can be exchanged in two minutes, fully recharged in 6 to 7 hours. They have no finish-rate limitations, require no equalizing. They are easily ventilated, too, if they must work in high temperatures.

In fact, EDISON batteries are so foolproof

electrically that even such accidents as external shorts and reverse charging cannot injure them. Consider, also, their famous steel cell construction, another major reason for their unequalled stamina throughout a useful life two to three times that of other batteries.

EDISON *plus-values* are more fully covered in our bulletins S.B. 3808 and S.B. 2039. Write for them and the address of your Edison field engineer. Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.



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Washington News

new form should cut the number of copies by 50 pct.

New forms can be used in ordering against contract, for purchases up to \$500 where no contract exists, and up to \$1000 without contract in the cases of the GSA and the Defense Dept.

Sign 'High Cost' Copper Contract

The government last week signed a contract with Copper Range Co., of Boston, for delivery of 7,965,000 lb of refined copper before the end of 1955. Copper is to be produced at the firm's "high cost" Champion mine in Houghton County, Mich.

General Services Administration agrees to pay 32¢ per lb, Connecticut Valley, less a differential of 1¢ per lb for all deliveries made by common carrier's conveyance, refiner's plant. The contract calls for production of 1,593,000 lb in 1953, and 3,186,000 lb annually in 1954 and 1955. Agreement is automatically terminated Dec. 31, 1955, or earlier, if the entire amount has been produced.

Copper Range has been operating its Champion mine without a government contract since Feb. 25, 1953, when price controls over copper were removed. GSA says the new contract results from a government determination that production from the Champion mine is necessary to insure enough copper for defense needs.

Close 6 AF Procurement Offices

Administrative overhead will be cut down, the Air Force says, when six procurement offices of the Air Materiel Command are closed later this year.

The offices are the Air Procurement District headquarters in New York, Chicago, Boston, Detroit, Ft. Worth, and Los Angeles. Before Dec. 31, they are to be eliminated and their functions consolidated in the Middletown (Pa.) Air Materiel Area headquarters.

About 100 officers and 1900 civilians are on duty in the district offices. Officers will be reassigned, and many civilian jobs will be "functionally" transferred. All of

the headquarters to be closed occupy leased office space, which will be closed or turned over to General Services Administration.

Closing of three Air Regional Offices also is provided for in current plans. These are located at Glendale, Calif.; South Bend, Ind.; and Minneapolis.

USAF Under Secretary James H. Douglas says that while more efficient operations are expected, there will be no change in Air Force methods or locations for buying.

Pensions:

Congress may review, OK personal retirement plans.

Demands of self-employed business and professional people for tax benefits which would permit establishment of personal retirement plans are certain to be revived—and possibly approved—in next year's session of Congress.

A House committee is studying proposals for changes in the Internal Revenue Code. Bills already submitted would allow the self-employed, plus employees of firms without qualified pension plans, to exclude for tax purposes 10 pct of gross earnings or \$7500 per year, whichever is less.

This money would have to go into a restricted trusteed retirement fund or a restricted retirement annuity contract.

A life insurance industry statement, submitted jointly by the American Life Convention and the Life Insurance Assn. of America,

backed the idea of tax incentives for individual retirement plans, but did not come out for previously submitted bills. The statement asked whether it would be sound to limit retirement investments to trust accounts or restricted annuities.

Because the House committee is interested solely in compiling data for future reference, there can be no definitive action on retirement plans before 1954.

Prime Contracts for Small Firms

Assistant Navy Secretary R. H. Fogler sees good opportunities for smaller firms to share in the completion of Navy prime contracts in the current fiscal year.

He has just announced that small business handled \$1.3 billion in procurements by his department in fiscal 1953. Companies with large Navy contracts also subcontracted an additional \$1.1 billion.

Small business, the Bureau of Ordnance notes, has an excellent record for producing rocket parts, 20-mm shell spare parts, practice bombs, and ammunition boxes.

Mr. Fogler's announcement indicates the Navy will make a greater effort to advise small business of forthcoming procurements.

Westinghouse Patents Available

Listed among 231 patents which Westinghouse Electric Corp. has recently opened to the public for unrestricted use are a number relating to transformers, amplifiers, resistors, rectifiers, circuit breakers, and electric furnaces.

Most of the patents in the group apply to the electronics field, U. S. Patent Office says. In addition to those named are patents connected with electric control systems for motors, arc welding machines, electric locomotives, machine tools, drill presses, and milling machines.

The Patent Register, U. S. Patent Office, Washington 25, D. C., has lists of the newly-available patents, plus a pamphlet naming 609 previously placed in the public domain. This information will be provided free upon request.



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And now Multipress is available in all sizes with Denison's new Touch Control.

Touch Control gives operators complete, rapid, direct-acting regulation of ram movement and effort—the press ram starts, stops, reverses, accelerates or slows down with instant response to every movement of the Touch Control lever.

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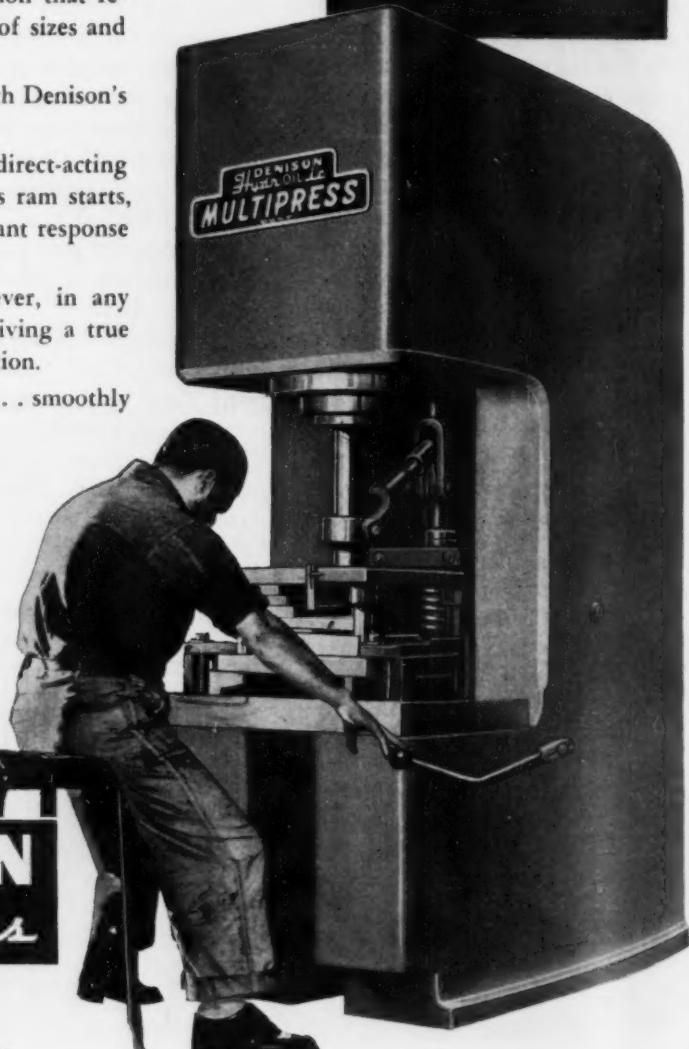
Ram effort can be built up rapidly or slowly . . . smoothly or in stages . . . and can be held at any tonnage for any needed dwell period. Applied pressures are shown on the dial gauge.

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West Coast Report

East's Steelmen Press for Markets

Softening demand for steel in the East and auto production slowdown is forcing steelmakers to look west . . . Market is estimated at 6 million tons yearly—By T. M. Rohan.

Eastern steel producers were getting ready last week for a battle for long-neglected western markets.

Faced with a softening demand at home and egged on by the GM transmission plant fire which forced an auto production slowdown, the western markets looked better than ever.

Get Allotment . . . One western user unexpectedly got a fourth quarter mill allotment of several hundred tons of cold-rolled sheets. It was the first quota for this product in years and was sold at a mill price about \$28 per ton cheaper than current conversion sheets.

Only cold-rolled sheets previously shipped by this firm have been spot tonnages, usually resulting from cancellations in the East.

Shipments of other steel products, such as cold-finished bars and tubing, are likely to be increased in the fourth quarter by eastern steel producers. Additional tinplate is also available for fourth quarter delivery. Although most tinplate commitments are made for this year, 1954 sales effort will be spirited.

Midwest producers are also reported reaching heavily into the inter-mountain Denver area for sheet sales, principally galvanized.

Absorb Freight Cost . . . Freight absorption will play a major role in revival of western sales effort. One major eastern producer is launching an exhaustive point-by-point review of possibilities.

Western sales representatives, tired of saying "no" to purchasing agents, are expected to urge absorption strongly. Mounting freight rates alter the situation

from pre-war days although rail, trucking and ship operations and facilities have expanded. Eastern firms believe new mills will permit steel deliveries to California at below western prices.

Wait and See . . . Steel consumers have yet to feel the impact of the East's attempt to market in the West and are adopting a wait-and-see attitude. Most have cultivated a single producer for major requirements on finished products, making up shortages from other producers and occasionally warehouses at a premium.

One major appliance manufacturer said his September mill allocation was low and October was worse. One of his occasional suppliers could offer no sheet tonnage.

Need More Steel . . . The seven western states now amount to over a 6 million ton annual total finished steel market. In 1949 it was 4.4 million, in 1950 about 5.1



FIVE MILLIONTH 81-mm mortar shell made by Rhee Mfg. Co. is presented to Brig. Gen. J. B. Medaris by Rhee's E. C. Bergen.

million and in 1951 and 1952 about 6 million.

Western production this year is estimated at about 4.1 million while consumption will hit about 6.2 million.

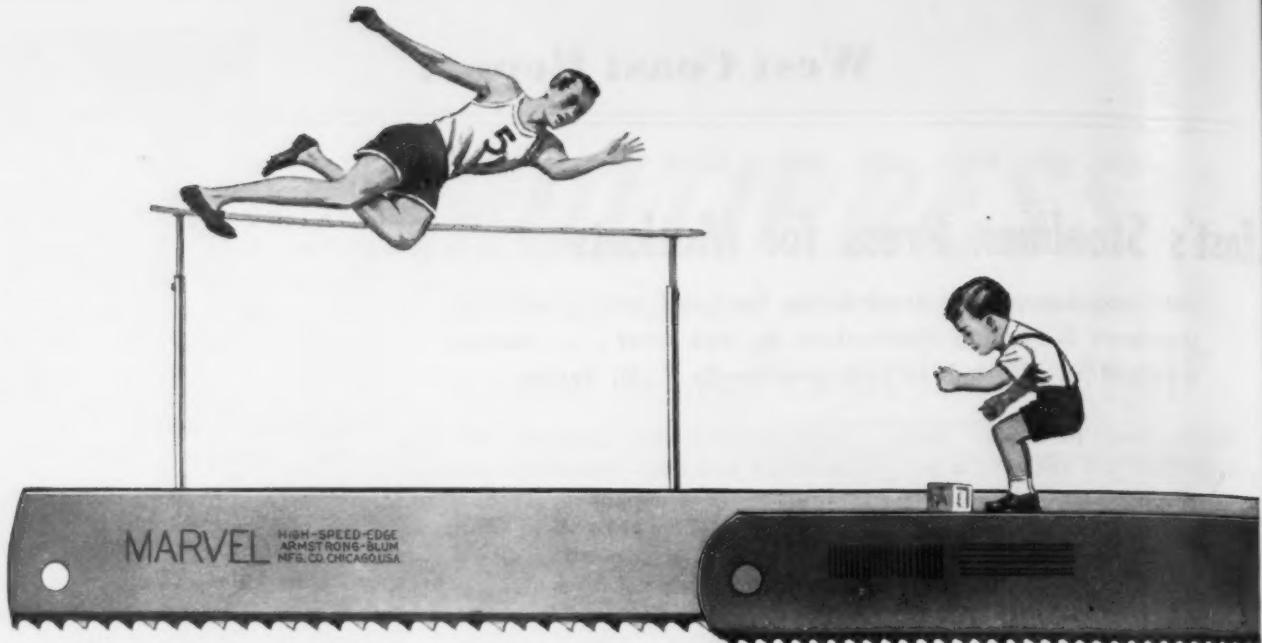
Gas Truck Comeback . . . The gasoline powered truck isn't through yet. Engineers attending the Society of Automotive Engineers International West Coast meeting in Vancouver, B. C., were told the U. S. will not follow Europe's trend to heavy diesels.

SAE President Robert Cass of White Motors Co., Cleveland, said the fuel price differential gave the diesel its big start in Europe. In U. S. prices are now comparable so performance and basic economies will be deciding factors.

Gas truck motors now turn out up to 200 hp, adequate for present needs, and still have more room for development than diesels, he added.

Market Grows . . . Western market potential is now estimated to be 400 pct greater than local productive capacity. In 1952 total U. S. industry sales were about \$5 billion compared to \$500 million in 1940. California electronics production is split about 75 pct for the Los Angeles area and 25 pct for San Francisco. High manufacturing costs are offset by sector's reputation as a quality producer.

Boost Power . . . The highest voltage U. S. auto-transformers, six 200,000 kva Allis-Chalmers units, will go into service on the Bonneville Power Administration's McNary dam in Oregon in 1956. The Milwaukee firm last week nosed out Westinghouse at \$2,042,112 and General Electric at \$2.5 million for the \$2,058,378 order. Two bids of \$1.3 million and \$1.5 million by English and Australian firms were disqualified for lack of experience in high voltage and large capacity equipment.



...but

Experience Cannot be Copied

More than a quarter-century ago MARVEL invented and basically patented the MARVEL High-Speed-Edge Hack Saw Blade—the UNBREAKABLE blade that increased hack sawing efficiency many-fold.

Every MARVEL Hack Saw Blade ever sold has been of that basic welded high-speed-edge construction, with constant improvements from year to year, as EXPERIENCE augmented the "know-how" . . .

MARVEL is not "tied" to any single source of steel supply, and has always used the best high speed steels that became available from time to time as metallurgy progressed. When-as-and-if finer steels are developed—and are proven commercially practical for welded-edge hack saw blades—MARVEL will use them, regardless of cost or source . . .

There is only one genuine MARVEL High-Speed-Edge! All other "composite" or "welded-edge" hack saw blades are merely flattering attempts to imitate—with the "know-how" of MARVEL EXPERIENCE . . .

Insist upon *genuine* MARVEL High-Speed-Edge when buying hack saw blades—and be **SAFE**, for you can depend upon MARVEL. They have been "tested", "pre-tested", and "re-tested" by thousands of users for more than a quarter-century!



ARMSTRONG-BLUM MFG. CO. • 5700 Bloomingdale Ave. • Chicago 39, U. S. A.

Machine Tool High Spots

Vacations Slug Tool Orders, Shipments

Industry vacations during July forced a drop in the new order index and shipment rate . . . Cleveland area hit hardest . . . Study boron machinability—By E. C. Beaudet.

A large segment of industry went on vacation during July and the holiday showed up in monthly index figures issued by the National Machine Tool Builders' Assn.

Index on new orders fell to about 247.4 from the June mark of 273.4. Shipments also felt the impact of the seasonal lull. The decline in this area was much sharper as index figures fell almost 80 points from 342.2 in June to 264.5 in July. Decline in shipments did not alter the backlog picture which remained steady at a little over 7 months.

Despite the decline industry volume of orders still stayed above that recorded in the fourth quarter last year. However, the July slump has generally reflected a downward trend which began in the waning months of '52.

Show Gain . . . Index on foreign shipments again showed a gain moving from 16.6 in June to 18.7 in July. The tool builders' association says foreign business accounted for 7 pct of all July orders. Many builders say this development may be an indication of a fall trend.

A few firms contacted by THE IRON AGE reported business surprisingly good. One company in particular said sales for July and August were much better than expected.

Other tool builders have been kept busy by the General Motors fire. Practically as soon as the flames were extinguished the machine tool industry set up a direct pipeline to get production for Hydramatic transmissions back to normal. Machines have already been dragged out of the rubble in Livonia and those not beyond repair are being rebuilt as quickly as possible.

A flood of new tools is also going

to Michigan. Extent of this movement is highlighted by one firm which reports that at least 200 of its machines will have to be replaced.

Government Leasing . . . Tool builders this week also evinced a growing interest in final recommendations from ODM on leasing of government tools to defense contractors.

The scarcity of alloying elements continues to be a major problem for both steel producers and users. But efforts to increase use of boron steels have done a lot to alleviate this problem.

Much still remains to be learned about the machining characteristics of boron steels, however, and to gain information along this line, Metcut Research Associates recently completed an Ordnance research program.

Under the technical supervision of Watertown Arsenal Laboratories, single-point lathe turning tests were conducted to determine the relative machinability of boron steels.

Compare with Standard . . . Watertown Arsenal has sought to promote use of alternate grades of boron steels and in so doing has encountered the question of machinability of these boron steels as compared to their standard alternates.

Metcut compared the machinability of various steel compositions listed below, grouped by comparable hardenability:

4817H	4140	1345
94B17	81B40	14B45
4340	8640	9262H
98B40	80B40	50B60
86B45		

Steels used were in commercially annealed condition. Because commercial annealing practices vary with composition, rolled section and source of supply, microstructures differed accordingly, and those of the boron steels in most instances did not correspond with those of their respective hardenability equivalents.

As Good or Better . . . Test conclusions showed that the boron steels studied machined as well or better than equivalent standard alloy steels. This was true whether high speed steel or carbide cutting tools were used.

It was further anticipated that if annealing had been employed to produce microstructures in the boron steel identical with those of their higher alloy standard steel equivalents, the boron steels would have demonstrated even better machinability.

3-D Planning . . . Three-dimensional visual planning is being given greater acceptance throughout industry. Several firms which specialize in making equipment models have emerged recently.

Now scale models of machine tools for making shop layouts are being offered on a free-loan basis by the South Bend Lathe Works. Several models each of nine different machine tools are included in the standard kit. The kit also contains models of mechanics and has floor layout sheets cross-ruled to the same scale as the models.

Easy to Move . . . To use the models effectively all that has to be done is to sketch the shop floor plan to scale on the cross-ruled layout sheet. Machine tool models are then placed on the floorplans and manipulated until a satisfactory arrangement is made.

One of the main advantages of using models for shop planning is the speed and ease with which they can be moved.

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.
2157 SCRANTON ROAD • • • CLEVELAND 13, OHIO



"SHINYHEADS"

America's Best Looking Cap Screw
Made of high carbon steel — AISI C-1038—to standards for Full Finished hexagon head cap screws—bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 90,000 p.s.i. Carried in stock.



"LO-CARBS"

Made of AISI C-1018 steel—bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size—not machined. Points machine turned. Tensile strength in accordance with SAE Grade 2. Carried in stock.



FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots—less burrs. Flat and chamfered machined point. Carried in stock.



"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.



CONNECTING ROD BOLTS

Made of alloy steel—heat treated—threads rolled or cut—finished to extremely close thread and body tolerances—body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.



FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert—steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

"HI-CARBS"

Heat Treated Black Satin Finish
Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength in accordance with SAE Grade 5. Carried in stock.



SET SCREWS

Square head and headless—cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.



FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots—less burrs. Flat and chamfered machined point. Carried in stock.



ADJUSTING SCREWS

Valve tappet adjusting screws—Hexagon head style—to blue print specifications—hexagon head hard; polished if specified—threads soft to close tolerance—points machine turned; flat and chamfered.



SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.



STANDARDS

carried by
LEADING
DISTRIBUTORS

SPECIALS

furnished to
BLUE PRINT
SPECIFICATIONS

WRITE FOR
INFORMATION

SEND FOR SAMPLES

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

REPORT TO MANAGEMENT...

Do purchasing agents see trouble?

Production boom's at a crest

Economy strong down the line

Cornucopia not being stopped up

Guided by order backlogs

Shortages definitely dead

Consider mild deflation more likely

Pity the purchasing agent who in past decades has been dealt discredit by Monday morning quarterbacks for helpfully nudging us into recession by pessimistic retrenchment on inventory . . . Don't construe the PA's current paring of inventory as his vote of no confidence in the economy. Understand his motives and you won't bolt off into misinterpreting clear-sighted planning as ducking into a foxhole to avoid trouble.

How valid is the logic of contracting inventory in the teeth of today's production and sales whirlwind? . . . National product value is over \$372 billion against pre-Korea's \$280 billion; total employment has peaked at 63.1 million, yielding a personal income rate of \$284.5 billion against only \$266 billion in second quarter '52 . . . For the third month manufacturers' June sales floated on a cloud-high plateau of over \$26 billion while total consumer purchases in the second quarter spurted \$13 billion over '52.

Reporting corporations' cash dividend payments in July leap-frogged June by 5.5 pct and for the first 7 months were 4.5 pct over '52. Sagging somewhat in June, the construction boom for 37 states east of the Rockies regained momentum, given impetus by highest monthly awards for commercial building . . . Electric power output of 8,513,782,000 kw hours for the week ended Aug. 15 crackled above the record set for Aug. 1. Unhampered by strikes, the iron ore fleet for the period ending Aug. 17 hauled 58.5 million tons against 30.8 million in '52.

This statistical sweet talk although heartening is not beguiling the PA into rashness. But neither is he cutting inventory in the conviction that the cornucopia of sales and demand is being stopped up. Instead he's bracing for "come what may," watching for thin spots in the boom, and is modifying buying habits because of absence of shortages, stable prices that make short term buying attractive . . . Procurement previously functioned with availability as the prime concept. Watch the increasing transition toward procurement based on competitive advantage.

Guiding the PA in many cases are order books of his firm, slowly but persistently declining. Because new orders placed in June were below the \$26 billion sales rate, unfilled orders for industry continued edging down, now stand at about \$5 billion below last September's steel strike-influenced record . . . Three years ago order backlogs were 2.3 months of sales. Today they're still high at 5.1 months. So, slightly dwindling order backlogs do not spell calamity for the PA but cue him to caution.

Suspecting a slight sales downturn evolving, the PA has no real incentive to load up, especially when materials shortages—even in steel—are almost overwhelmingly dead. Should anything amiss develop, the PA does not want a millstone of high inventory around his neck . . . Now, he can buy what his plant needs with shorter delivery, little difficulty, and many times at lower prices. In June '52 prices of all raw materials or semimanufactures as percentages of wholesale prices stood at 98.3 pct. June, this year, the level had been planed to 95 pct.

Since many PA's consider mild deflation more likely than inflation, they have not been strong-armed into heavy buying in recent months—buying that would have been disproportionate to the production rate . . . Incidentally, this already full-blown caution will serve to cushion any drastic slashing of inventories now . . . Tempted to think prices may skid a little lower, the PA won't chance entering an era of bouncier competition burdened with high-priced inventory.

This Memo Concerns You

COPPERWELD STEEL COMPANY
WARREN, OHIO



INTERIOR CORRESPONDENCE

FROM Executive Vice President
SUBJECT Steel Alloy Leaded

DATE July 29, 1953

TO General Manager-Sales

BOB:

We have begun operating our new installation for producing electric furnace carbon and alloy steel with lead under the Inland license.*

I believe it is now in order to let our customers know that Copperweld can furnish leaded steels so that they can take advantage of its economies such as improved machinability, improved production and longer tool life.

One of our friends called yesterday to say that their trial of leaded 4140 annealed showed a machinability rating of 100 compared to 60-70 for the same steel not lead treated. This result while probably better than can be hoped for in every instance indicates the potential value that most users can expect in improved production.

C.W.H.

Send a copy of
this memo to our
sales offices in:

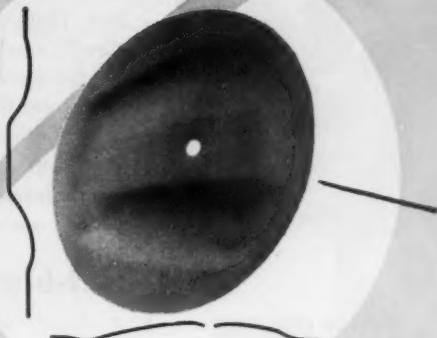
New York
Chicago
Tulsa
Cleveland
Detroit

Los Angeles
Houston
Seattle
San Francisco
Syracuse

R.S.C.

the **ABC** of improved deep drawing: **A**bsolute **B**lank **C**ontrol

...and only the **Hydroform** has it!



Shown are three views of *one continuous draw* —the Hydroforming of an appliance base from a 12" blank of .074" cold rolled steel. Hydroforming permits stopping the forming action and examining the part at any point in the draw.



Note, in the initial phase of the draw, that the Hydroform's flexible die member holds the outer edge of the blank flat on the draw ring, yet causes the center area of the blank to move quickly into contact with the punch ahead of the draw. This is the result of the complete blank control provided by the Hydroform and is not obtainable in conventional dies.



As the draw progresses, the material continues to be formed to the contour of the punch. That portion of the blank previously formed has been clamped to the punch surfaces, preventing further stretch or thin-out.

At the end of the stroke, high pressure and the edging control feature combine to finish form the part, complete with extruded hole and sharp flange radius, in this single drawing operation.

These illustrations show the Hydroform's infinite, accurate control over the blank during the entire (single) drawing action. The material is made to "hug" the punch progressively throughout the draw. With absolute blank control, Hydroforming makes possible more complex forming and deeper drawing in a *single* operation than conventional methods allow. Plan now to invest in new methods for cost reduction and product improvement. Investigate Hydroforming! Call in a Cincinnati Milling field engineer. For a description of the *five sizes* of Hydroform machines, write for Bulletin M-1759-2.

ONE CONTINUOUS DRAW

Solid lines below and to the left of each view represent the horizontal and vertical sections on centerline at that point in the draw.

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U.S.A.



Hydroform



STANDARDIZED • MASS PRODUCED • LOW PRICED
... give you advantages of the most expensive cranes

Now you can select your overhead electric traveling crane by size and type from a catalog. In the new standardized, mass produced Series "D" 'Load Lifter' Cranes you get a crane constructed on design principles that have made "Shaw-Box" Heavy Duty Cranes outstanding performers. For example, only in Series "D" 'Load Lifter' Cranes can you get these 8 crane bridge advantages:

LONG LIFE MECHANISM. All gearing in a sealed housing and operating in oil.

LOW COST OPERATION. Friction reduced to the minimum by supporting every moving part on ball bearings.

MAXIMUM STRENGTH with minimum dead weight because of advanced design and distribution of metals.

ACCURATE, EASY CONTROL. Variable-speed magnetic control and bridge brake to control drift assure accurate spotting.

MAXIMUM SAFETY. No open gearing. Cross wires are kept between and inside the girder flanges.

LOW MAINTENANCE. Motor and drive shaft are permanently aligned and all gearing operates in an oil bath.

EXCEPTIONALLY RIGID BRIDGE free from whipping and skewing because of its three-girder construction.

LONG WHEEL BEARING LIFE. Wheels are mounted on axles that rotate on ball bearings, equally loaded, on each side of the wheel.

Series "D" 'Load Lifter' Cranes are built in three basic types and three styles of trolleys with manually or electrically operated traverse motion. For floor-control a pendant type push button assembly is provided. On cage controlled cranes operation is by master switches. Get complete feature-facts about every capacity. Write for Catalog 221.

Load Lifter® CRANES



MANNING, MAXWELL & MOORE, INC. Muskegon, Michigan

Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, and 'American' Industrial Instruments.

Free Publications

Continued

Low cost rebuilding

Straight line mass production techniques and economies applied to the reconditioning and rebuilding of arc welding equipment are discussed in a new bulletin. How Lincoln-conditioning cuts costs by rebuilding welders in production lots, assembly line methods of dismantling, reconditioning and reassembly is clarified by illustrations. All parts are factory tested to meet "like new" specifications. New welder performance is guaranteed. Electrical equipment, gasoline and diesel engine rebuilding is also worked into conveyor line procedures. *Lincoln Electric Co.*

For free copy circle No. 13 on postcard, p. 11.

Nut-blank production

A new automatic bar machine that assures greater production of nut blanks from bar stock, is discussed in a recent pamphlet. The machine can be adapted also to the manufacture of other parts from bar stock in which drilling, forming of ends, counterboring a severing from the bar is required. Design features are described in a new pamphlet. *Miller Glass Engineering Co.*

For free copy circle No. 14 on postcard, p. 11.

Tractors

Presentation of the four diesel-powered crawler tractors "Inside and Out" is made in a new catalog which shows details of construction of each model with full cutaway pictures, and the variety of applications of each on the job. Cross-sectional views with job application illustrations are found for each model. *Allis-Chalmers Mfg. Co.*

For free copy circle No. 15 on postcard, p. 11.

Conversion

Forty-two standard modernization and conversion assemblies have been developed to restore full operating efficiency to old presses. The modernization assemblies, applicable to all Bliss-built presses, are described and illustrated in a new 16-p., two-color booklet just issued. *E. W. Bliss Co.*

For free copy circle No. 16 on postcard, p. 11.

These furnace operators

cut fuel costs, reduced cycle time with the LIGHTEST WEIGHT insulating firebrick

Here's "production-line" proof of actual savings made by replacing heavier brick with the lightest weight insulating firebrick made today—B&W IFB.

LARGE FORGE FURNACE

Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Furnace Output, pieces per hour	70	100	Increased 43%
Heating-Up Time, minutes	210	35	Reduced 83.3%
Cycle Time, minutes	50	30	Reduced 40%
In addition:			
Fuel consumption during heating up	.....	.....	Reduced 83%
Fuel consumption during operation	.....	.....	Reduced 50%

ANNEALING FURNACE

Comparative Furnace Tests

	Standard Firebrick	B&W IFB	Change With B&W IFB
Heating-Up Time, hours	52	31	Decreased 40%
Total Cycle Time, hours	131	114	Decreased 13%
Fuel Consumption, lbs./cycle	12,792	8,159	Decreased 36%
Early Output, tons	946	1,100	Increased 16%

MAGNESIUM MELTING CRUCIBLE FURNACE

Comparative Furnace Tests

	Ordinary Firebrick	B&W IFB	Change With B&W IFB
Fuel Consumption BTU/HR	1,000,000	500,000	Decreased 50%
Control	100 to 150 F overshoot of critical pouring temperature	no overshoot of critical pouring temperature	

What's behind these remarkable records of B&W IFB? Light weight for one—in fact B&W IFB is lighter in weight than any other insulating firebrick. This means they store and conduct less heat, provide faster heating-up time and lower fuel consumption. These brick also respond rapidly to changes in heat input, assuring excellent temperature control.

Get all the facts on B&W Insulating Firebrick from your local B&W Refractories Engineer. He may be able to point the way to lower production costs for you.

B&W REFRactories PRODUCTS—B&W Allmul Firebrick • B&W
No Firebrick • B&W Junior Firebrick • B&W Insulating
Firebrick • B&W Refractory Castables, Plastics and Mortars

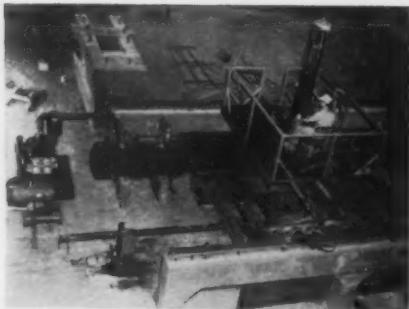


**BABCOCK
& WILCOX**
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42ND ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.



NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 69 or 70.



Machine breaks up chrome slabs and other alloys

Instead of the usual sledge hammer and dropping of a ball method for breaking alloy slab, a new chrome slab breaker mechanizes the operation and accomplishes the same results in 15 min that formerly took 2½ hr. The machine is rated at over 60 tons per hour. It has a span of 20 ft that can

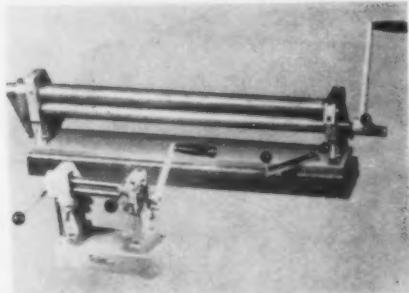
be built with various size strokes, depending on the impact required, ranging from 42 to 84 in., and delivers 50 to 60 frequencies a min with a 64,000 ft-lb impact. Operation of drive and impact hammer are pneumatic. Hammer operates at 100 lb pressure. *R. P. B. Corp.*
For more data circle No. 17 on postcard, p. 61.



Barrel tumbler speeds up removal of slag

A new line of deburring equipment, known as the BurrMaster, includes this new barrel tumbler that removes welding slag, flame cutting slag, burrs and rust from weldments and machined parts. Actual time study records show items processed can be deburred in one-third the time necessary to process by hand. Compact unit is welded steel

construction with aluminum barrel door for easy installation or removal. Insides of barrel and barrel door have neoprene linings that extend barrel life and assure quiet operation. The large BurrMaster barrel is 32 in. diam x 48 in. long, having total load capacity of 2000 lb. *White-Roth Machine Corp.*
For more data circle No. 18 on postcard, p. 61.



Advanced rollers increase bending versatility

Addition of six new models of a hand operated roller increases the material capacity and forming width over previous models. These Di-Acro rollers have a material capacity ranging from 16 to 24 gage sheet steel, forming width range of 12 to 42 in., and radius capacity from 2 in. to infinity. The rollers

incorporate a cam-idler feature into their design which makes it possible to form circles of any diameter in two passes through the rolls. Circles of the same diameter as rolls can be formed in one pass by making a slight adjustment. *O'Neil-Irwin Mfg. Co.*
For more data circle No. 19 on postcard, p. 61.



Controls provide rapid heat-up, recovery time

General purpose heat-treating furnace for use throughout the full heat-treat range handles all requirements including high-speed steels at continuous heavy duty up to 2500°F. The unit can handle higher temperature work over shorter periods. Loading area is 14 in. wide x 24 in. deep x 12 in. high. The case is heavy electrical

welded steel. Gas-tight ports are provided for connecting atmosphere-reducing sources. Counterbalanced door is foot-controlled and air-operating. Flame curtain is below the opening and ignites automatically when the door opens. *Pereny Equipment Co.*
For more data circle No. 20 on postcard, p. 61.

Turn Page

A. V. ROE CANADA LTD. specifies "16-25-6" for rotor wheels in new Orenda jet engine



FROM the first designs to volume production, "16-25-6" was the alloy selected for rotor wheels in the new Orenda jet engine. A. V. Roe Canada Limited says, "No other alloys were considered during the development, since this particular alloy had become identified by and large as the successful specification . . .".

Acceptance like this has made "16-25-6" the most popular super-alloy steel for jet engine rotor wheels. It was first developed by the Timken Company during World War II and since it was the *one* suitable steel that could be produced commercially for jet engine rotor wheels, it helped make jet propulsion practical.

Today, more "16-25-6" goes into solid and composite jet engine rotor wheels than all other super-alloy steels com-

bined! That's because "16-25-6" has the *best* combination of the three top requirements for jet engine rotor wheels: 1) It has good high temperature properties. Operating at temperatures up to 1500°F., it retains high creep and stress rupture strength. And it has excellent resistance to scale and corrosion. 2) It is relatively low in strategic alloys. "16-25-6" uses none of the highly strategic alloys, contains no cobalt or columbium. 3) It has good machinability.

Make use of the Timken Company's wide experience in high temperature steels. We'll help you adapt "16-25-6" to your purposes—or help you pick other alloy steels suited to your needs. Write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

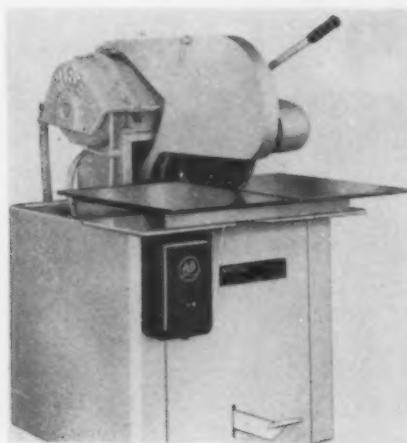


SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

August 27, 1953

New Equipment

Continued

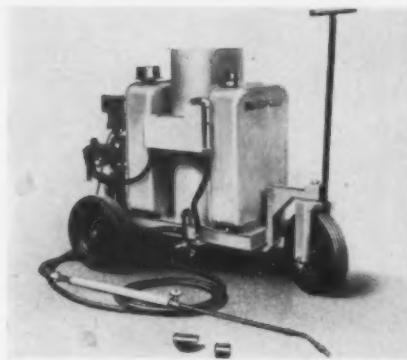


Cut-off saw converts to foundry operation

Great versatility is provided by this new heavy-duty, all purpose saw. By simply attaching the foundry bed and locking the cutting head (and removing handle) the unit is adapted to gates and riser cutting. By reversing this operation, the saw reverts to a chop-stroke operation for cutting bars and shapes. Wise saws are over-powered (7½ and 15 hp) to permit use of larger diameter (18 and 20 in.) cutoff wheels. This factor produces more cuts per wheel since

faster cuts reduce dulling or wearing of the abrasive wheel. These faster, straight-through cuts also avoid burning of metal and burring. Large throat room, accomplished by hinging the cutting head on the motor's end bells, provides work space for extra-large castings. Heavy duty, foot-operated V vise holdown for cutting bars, shapes and pipes is another feature. Spindle bearings are guaranteed for 1 year. *Henry H. Wise Co.*

For more data circle No. 21 on postcard, p. 11.



Steam cleaner features maximum utility

Easy movement on 16 x 4-in. rubber-tired wheels, and extra-heavy-duty welded steel chassis make a new JO hypopressure Jenny steam cleaner useful to road-building and construction contractors, and factories because of its ability to roll over rough ground. Its nozzle control system is said to save fuel, chemicals, water, and time by per-

mitting the operator to start and stop the unit at the cleaning job, 100 ft or more from the Jenny. Three simple steps are necessary to start or stop the unit; and from a cold start, a full-powered blast is delivered at the cleaning gun in less than 90 sec. Its vapor spray output is 90 gph. *Homestead Valve Mfg. Co.*

For more data circle No. 22 on postcard, p. 11.

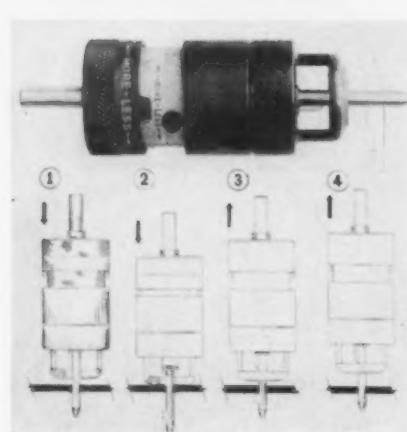


Machine expands and sizes metal tubing

Vertical tube expanding machine is a manually controlled type adapted to the expansion and sizing of copper tubing in evaporator and condenser coil assemblies. The model shown has expansion mandrels mounted on 1-in. centers. They expand sixty $\frac{3}{8}$ in. diam copper tubes 0.020-in. in an evaporator assembly to provide thermal-conducting, mechanical joints between the tubing and a stack of cooling fins. Another set of 60 mandrels, through which

the expanding mandrels feed, are picked up near the end of the down-feed to size the ends of the tubing for soldered return bend fittings by expanding them an additional 0.026 in. Cycle time for the operation including loading, expanding, sizing and unloading, is 40 sec. The machines are built in a variety of sizes, including completely automatic types, to meet special requirements. *Walter P. Hill, Inc.*

For more data circle No. 23 on postcard, p. 11.



Deburring tool speeds sheet metal fabrication

Simultaneous deburring and chamfering of both front and back faces of holes in sheet metal, plate, extrusions, castings and forgings is made possible by the new Noburomatic tool. In aircraft production it has proved effective in eliminating dangers of cracked dimples in riveted structures. It is suited for use in portable drill motors, or in stationary machine tools such as drill presses and turret lathes. The automatic action deburs the front

face of the metal during the entry of the tool in the hole. The rear side is deburred during the withdrawal cycle. Independent controls are provided for setting working depth of chamfer of front and rear cutters. Two models are available: for nonferrous metals and soft materials; for ferrous metals and relatively tough working materials. *Nobur Mfg. Co.*

For more data circle No. 24 on postcard, p. 11.

Turn to Page 78



Aiming for Better Production?

J&L SCRAPLESS NUT WIRE CAN'T BE BEAT

Scrapless nut production is a tough business. It takes the best in know-how, the best in equipment and the best in wire.

You supply the production know-how and equipment and J&L will supply scrapless nut wire that's *right*.

When we say *right*, we mean scrapless nut wire that has the—

SURFACE QUALITIES
WORKABILITY
UNIFORMITY
FINISH

... to increase die life, reduce down time and

boost your over-all production of a better finished product.

J&L Steel wire is quality controlled from the mine through the finished product. J&L has the modern equipment to produce a really uniform high-quality product. J&L has the steel-making experience to provide a dependable source of supply.

The result—you'll find that J&L scrapless nut wire can't be beat. Why not investigate its economies now? Contact the J&L representative nearest you or write: Wire Products Department, Jones & Laughlin Steel Corporation, 401 Liberty Avenue, Pittsburgh 30, Pa.



JONES & LAUGHLIN STEEL CORPORATION
PITTSBURGH



For **DEPENDABILITY**
IN
DIESEL ENGINES



**THE CORRECT FASTENER
FOR THE JOB!**

Precision and Quality Workmanship, backed up by 38 years of Erie experience, are yours for thoughtful buying. Whether you require a fastener made from carbon, alloy or stainless steels, to special design, to exacting specifications,

Erie fasteners will save you time and expense . . . from your planning, to procurement, to fabrication. Submit your fastener requirements to us, Erie Service will meet the challenge.



ERIE BOLT and NUT CO.
ERIE • PENNSYLVANIA

STUDS • BOLTS • NUTS
ALLOYS • STAINLESS
CARBON • BRONZE

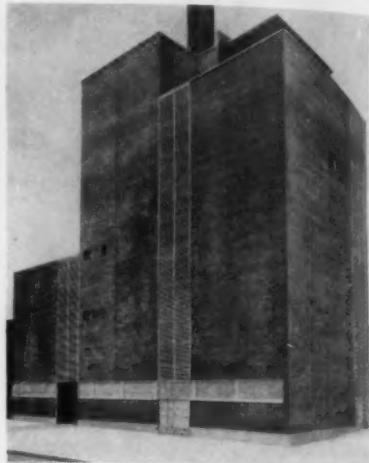
Representatives in Principal Cities.

New Equipment

Continued

Aluminum louvers

Three continuous vertical banks of Burt wall louvers 13 ft wide and 91, 76 and 41 ft high are part of the architectural pattern of an Arkansas paper mill. Designed by Rust Engineering Co., the louvers



were fabricated by Burt Mfg. Co. in all aluminum construction with aluminum blades 0.081 in. thick, and jambs 0.051 in. thick, using three SH-14 aluminum. Pivots are $\frac{1}{2}$ in. diam stainless steel with Oilite bearings. *Burt Mfg. Co.*

For more data circle No. 25 on postcard, p. 61.

Caster-steer trailer

A new controlled caster-steer trailer is designed to handle heavy high center of gravity loads. The caster-steering feature minimizes tipping hazards, assuring increased safety. Provision of an extra long wheel base and wide tire treads provides

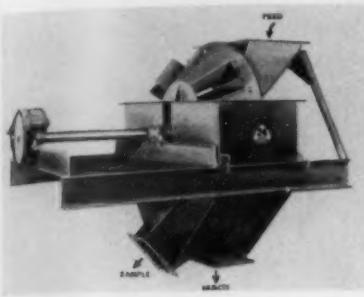


additional stability to this 8000-lb capacity trailer. Steering is accomplished by retractable tubular loop handle connected by tie rod linkage between hitch and caster assembly. Trailer is 24 in. high x 3 ft wide x 8 ft long. *Mercury Mfg. Co.*

For more data circle No. 26 on postcard, p. 61.

Ore sampler

The Snyder type ore sampler is used for dry sampling where there is limited headroom. It is ruggedly designed for accurate and representative sampling. The self-contained unit is welded steel construction.

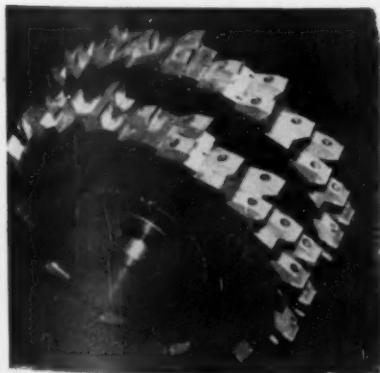


tion mounted on structural steel supports. Operation is easily observed and maintenance is low. Cutter openings are replaceable. A complete range of sizes is offered in both simplex and tandem samplers. *Denver Equipment Co.*

For more data circle No. 27 on postcard, p. 69.

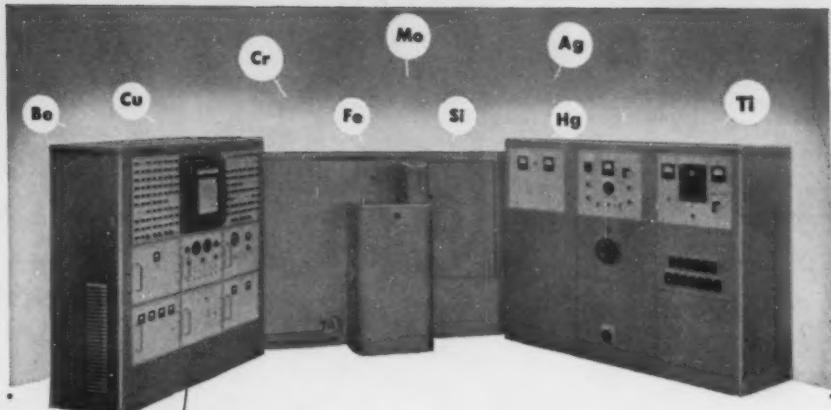
Milling cutter

In the design of a new milling cutter, manufacturing methods have been simplified and fastener costs lowered by using tapered end, hollow, split pins instead of ordinary dowel pins. The pins are used to locate blade ends of the new at-



tached blade milling cutter. Rigidity is obtained by seating the replaceable blade on the periphery of the cutter body, against a body abutment that takes all cutting forces. Blades are accurately doweled in place at two points. *Millit, Inc.*

For more data circle No. 28 on postcard, p. 69.
Turn to Page 82

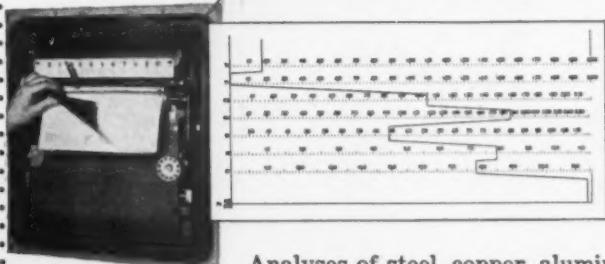


Element Determinations are 2300% FASTER WITH ARL PRODUCTION CONTROL QUANTOMETERS*

Users** of ARL equipment have found by actual experience that 42.50 element determinations per man-hour can be made by Quantometric analysis as against 1.85 determinations by chemical means. This means a tremendous savings in labor and time in routine production control analysis of almost any metallic alloy or inorganic compound.

Quantometers are photoelectric instruments that measure the quantities of most of the elements present in a sample. Each PCQ can measure and record quantitatively any 35 elements of your choice—as many as 20 simultaneously. Because this PCQ is completely direct reading, you get a multiple copy, inked record of the analysis of these elements in less than two minutes!

In addition to speed you get



COMPLETE ANALYTICAL COVERAGE

Analyses of steel, copper, aluminum, magnesium, zinc, lead and tin alloys are common accomplishments. Non-metallics, such as ores, slags, cement, lubricating oils, etc., may be analyzed with the PCQ. A single PCQ permits analyses of elements in several types of base materials thus serving as a multiple purpose unit when required.

Truly, the ARL Production Control Quantometer CAN
SAVE YOU MONEY in so many ways in your manufacturing processes that it deserves your most earnest consideration.

*Trade
Mark

**Names
furnished
on request

The ARL line also includes 1.5 and 2-meter Spectrographs, Precision Source Units, Raman Spectrographs and related accessories.

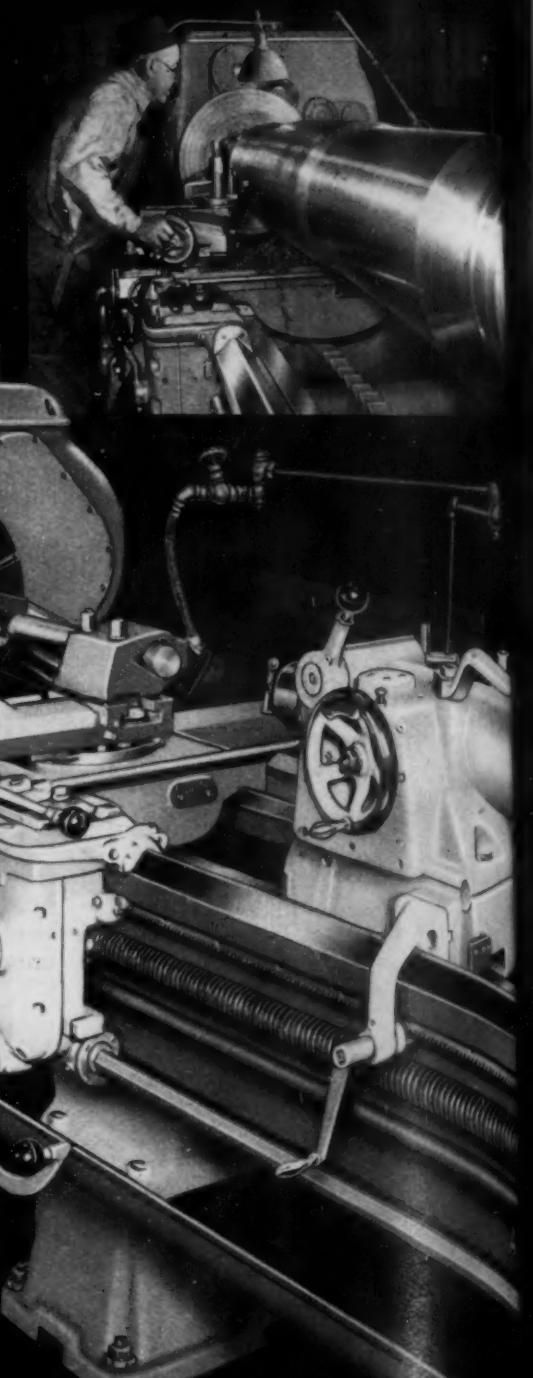
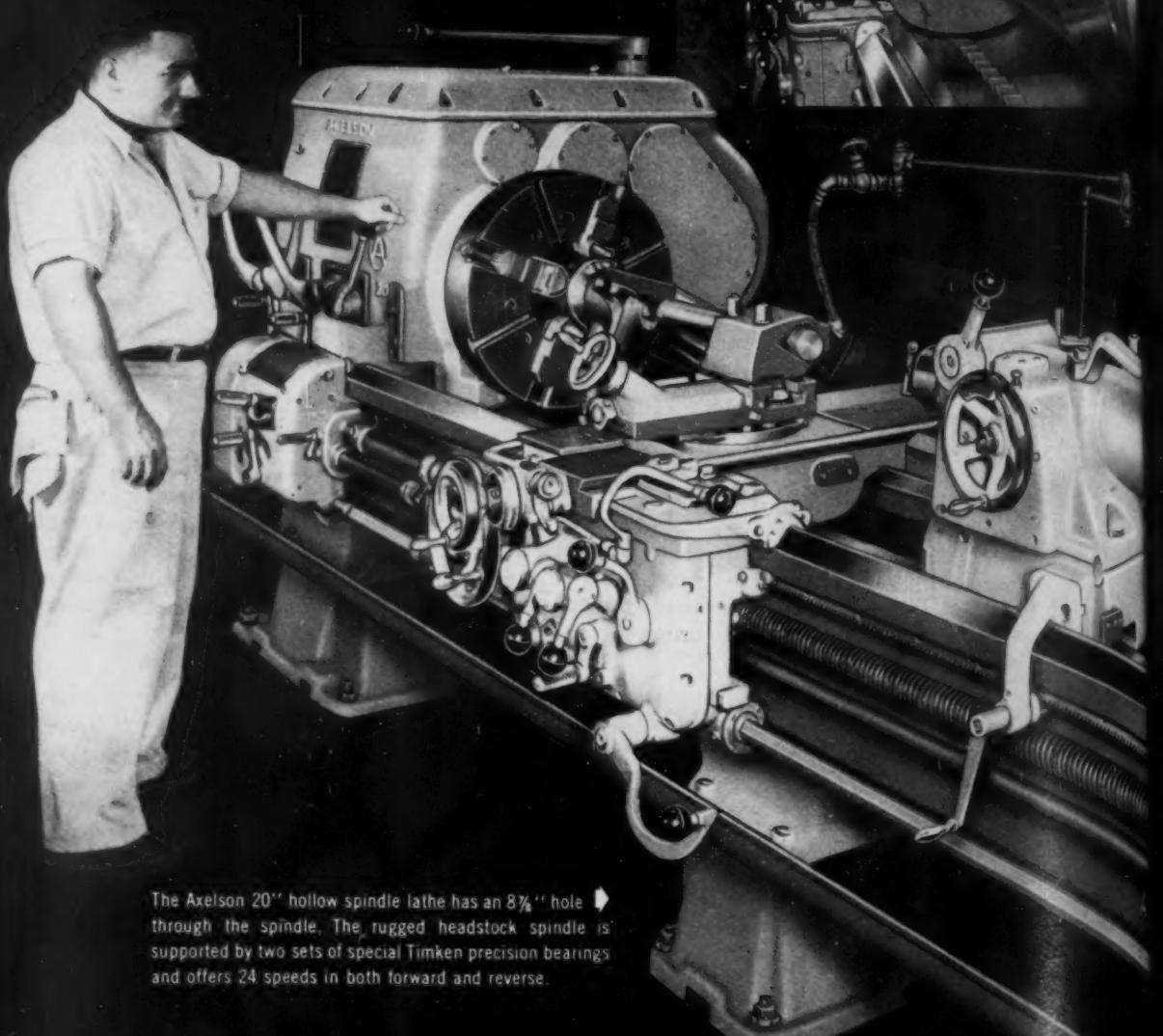


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Axelson 32" hollow spindle gap bed lathe with 11" hole and 125" swing over the gap, turning an aircraft part. The gap lathe line offers an immediate solution for turning problems that involve unusual shapes and variant lengths.

This lathe, 32" with 11" hole, handles extremely heavy cuts on long, large diameter shafts and tubing and will hold its accuracy on precision turning and threading operations.

The Axelson 20" hollow spindle lathe has an 8 $\frac{1}{2}$ " hole through the spindle. The rugged headstock spindle is supported by two sets of special Timken precision bearings and offers 24 speeds in both forward and reverse.



AXELSON HOLLOW SPINDLE LATHES

Once more Axelson is in a position to furnish their heavy duty, precision line of hollow spindle lathes. The same fine quality of workmanship and high degree of ruggedness so well known to the many users of Axelson engine lathes, is also inherent in the hollow spindle line. Axelson's own foundry casts and controls the high quality alloys that are a dominant part of every Axelson lathe casting. This factor, together with the close check kept on every manufacturing operation, is the reason why, from the heaviest roughing cut down to the finest precision cut, Axelson hollow spindle lathes give precise and accurate operation, together with long, dependable service. And critical dimensions "stay put"!

Axelson hollow spindle lathes are available in the following sizes: 20" with 87/8" hole; 25", 32", 32" x 100", 32" x 125" with 11" hole. In addition, Axelson manufactures heavy duty engine lathes in 16", 20", 25" and 32" sizes; precision tool room lathes in 16" and 20" sizes; gap bed lathes in 25" and 32" sizes. All lathes are furnished in various lengths.

Write for Bulletin #5308

Chosen first... to last! **AXELSON** Lathes



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A

TOOL ROOM LATHES • GAP BED LATHES • HEAVY DUTY ENGINE LATHES
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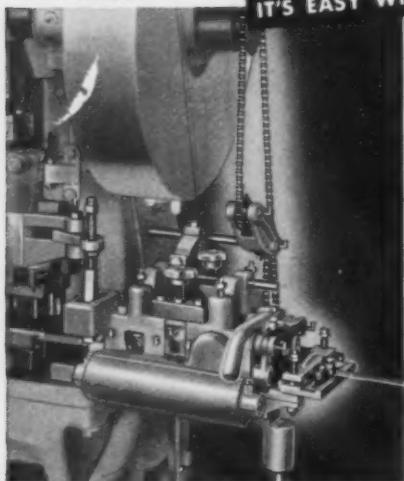
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Automatic Roll Feeds



Wittek automatic roll feeds fit all makes and sizes of punch presses—provide maximum efficiency and extreme accuracy in the high speed automatic feeding of strip stock. Made in single roll, double roll, and compound types with straighteners, in models to feed (push or pull) in any direction. Length of feed is easily adjusted to meet individual requirements.



4473

WITTEK Reel Stands

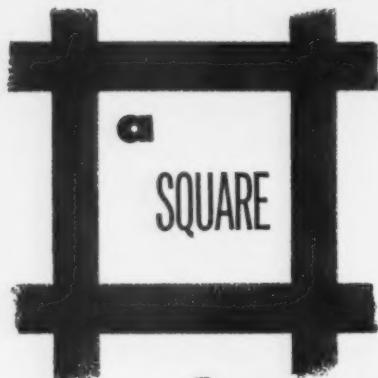
Simplify Handling of Coiled Stock

Choice of standard models to facilitate handling coiled stock . . . from small, light coils to those weighing up to 800 pounds. Larger reel stands automatically center the coils — provide frictional braking action to prevent overrunning, maintain uniform coil slack.

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ROLL FEEDS AND
REEL STANDS



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This close-up of Hendrick Perforated Metal Plate shows no ordinary screen. No other screening medium can equal it for uniformity of mesh, for non-binding clearance and for unparalleled long service life.

Flat or corrugated Hendrick Perforated Metal is available in any desired shape and size of perforations in high carbon steel and other commercially rolled metals. Decks can be changed fast and efficiently—cutting time and labor costs. For more details write for information.



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New Equipment

Continued

Gasketing material

Fluorlastic gaskets consist of silicone rubber completely enveloped in Teflon or Kel-F. The gasket combines the high and low temperature properties of silicone rubber with the chemical inertness of Teflon and Kel-F. They have the compressibility and rubber-like properties of the silicones together with the chemical stability of the fluorocarbons. Strip-type gaskets in various shapes and sizes, in lengths up to 96 in. and widths of 4 in. are available with both Kel-F and Teflon envelopes. *Connecticut Hard Rubber Co.*

For more data circle No. 29 on postcard, p. 61.

Metal-to-metal bond

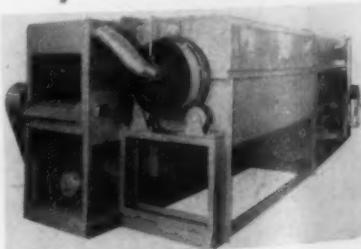
New adhesive, which applies easily, sets quickly, and produces a bond with 3000 psi strength to join similar or dissimilar materials or metals has been announced. This product, named Adweld, is said to have outstanding holding power, comparable to that of metal welds, and has particular application in those industries where it is dangerous to weld because of fire hazard. Adweld can be made to set in 10 min, and only clamps are required for successful application. *Miracle Adhesives Corp.*

For more data circle No. 30 on postcard, p. 61.

Washing machine

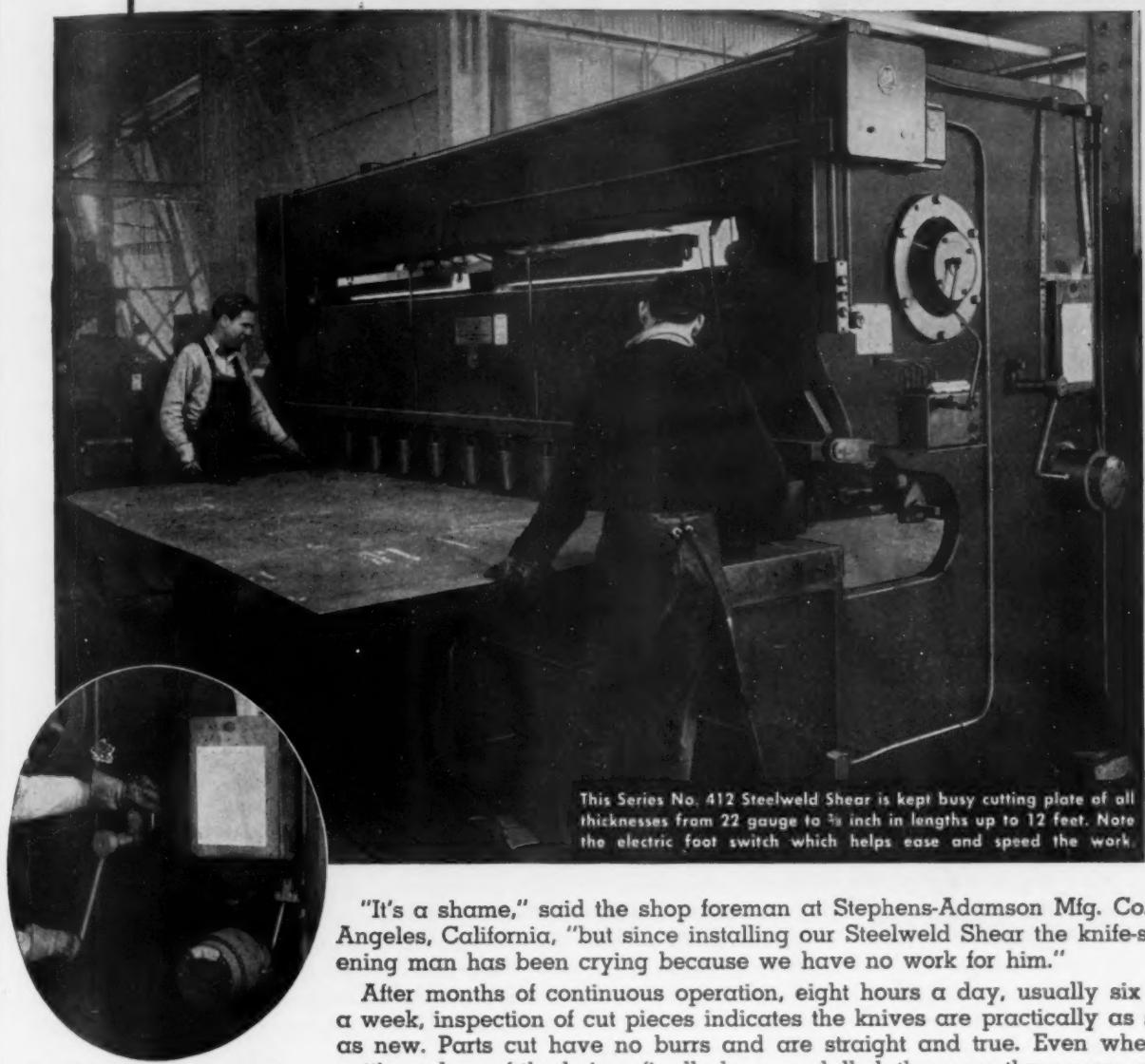
Combination rotary drum and flat belt washing machine is designed to remove drawing compounds, cutting oils, grease, and shop dirt from metal parts. Small parts that can be tumbled are washed, rinsed, and dried in the drum, while the tote boxes and larger parts are processed on the conveyor. *Metal-wash Machinery Corp.*

For more data circle No. 31 on postcard, p. 61.



Turn to Page 84

KNIVES STAY SHARP LONGER for California Steelweld Shear User



This Series No. 412 Steelweld Shear is kept busy cutting plate of all thicknesses from 22 gauge to $\frac{3}{8}$ inch in lengths up to 12 feet. Note the electric foot switch which helps ease and speed the work.

"It's a shame," said the shop foreman at Stephens-Adamson Mfg. Co., Los Angeles, California, "but since installing our Steelweld Shear the knife-sharpening man has been crying because we have no work for him."

After months of continuous operation, eight hours a day, usually six days a week, inspection of cut pieces indicates the knives are practically as sharp as new. Parts cut have no burrs and are straight and true. Even when the cutting edges of the knives finally become dulled, there are three more cutting edges ready for use as all four corners of each knife are prepared for shearing.

Stephens-Adamson like their Steelweld Shear and are happy over its operation. It plays an important role in the manufacture of screens, elevators and conveyors which are the principal products of this large West-coast plant. In their words, it is "heavy, well built and dependable. We know it is reliable and always ready to handle our work from day to day."

One of the big reasons why knives stay sharp longer on Steelweld Shears is the simplicity with which knife clearance can be adjusted for every plate thickness. It's merely a matter of turning a hand crank until the gauge pointer is on the proper figure. No bolts to loosen. No need of a feeler gauge.



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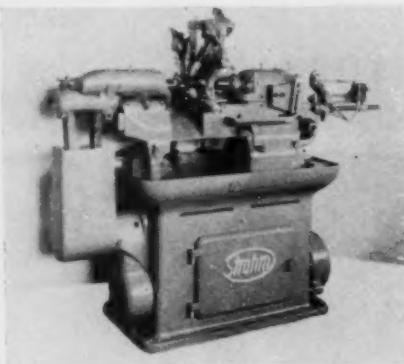
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Lansing Stamping Co.
"ESTABLISHED 1914" MICHIGAN

New Equipment*Continued***Swiss type automatic**

A larger Strohm Swiss type automatic has a round stock capacity of 20 mm (about $\frac{3}{4}$ in.) to meet the demand of precision work for larger parts. This machine, known as the M205, has five tools with a maximum turning length of 4 in. with flat cam and 6 in. with bell cam. *Hudson Automatic Machine & Tool Co.*

For more data circle No. 32 on postcard, p. 69.

Reversibles

New series of 24 lightweight, air-operated, reversible screwdrivers and nut setters feature reversible motors to permit the tool's use for removing threaded fasteners as well as applying them, and for speeding inspection, testing, service and repair of all assembled products. Reversibles are available in four basic speeds, ranging from 475 to 2000 rpm. Each is offered with slip or positive clutch, lever or pistol type throttle. *Thor Power Tool Co.*

For more data circle No. 33 on postcard, p. 69.

Plastic sealant

New plastic seal, Imprex, is said to permanently seal excessive leaker and even squirter pressure castings. Its penetration properties enable it to saturate all porous areas. Upon hardening, there is no loss from evaporation. This low shrinkage factor enables the seal to maintain its bond to the casting as it hardens into a solid, non-brittle material. Imprex may be washed off with water. No solvents are required. *Tincher Products Co.*

For more data circle No. 34 on postcard, p. 69.

Insulating material

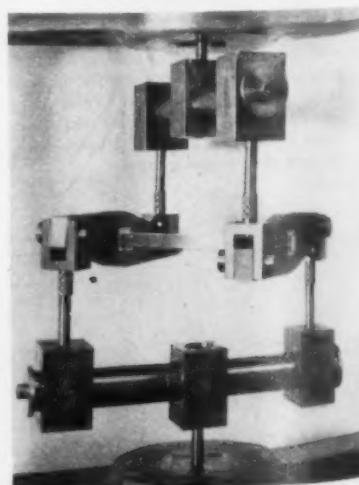
New quick-drying material that can be sprayed like paint on metal makes the treated surface capable of withstanding temperatures as high as 5000°F. Called Pyrolock, a 1/16-in. coating of the new insulation protects metal for as long as 10 sec against flame temperatures hotter than the melting point of metals. The material is non-toxic, non-flammable, non-explosive and will adhere directly to clean metal surfaces without sand blasting or use of priming surface preparations. Pyrolock is resistant to most solvents and chemicals. *B. F. Goodrich Co.*

For more data circle No. 35 on postcard, p. 69.

Torsion test device

To produce pure torsion on a tension testing machine Baldwin-Lima-Hamilton announces the Schaevitz torsion device. Test specimens up to $\frac{3}{4}$ in. square and ranging from 2 to 12 in. long (plus 2 in. to be engaged by torque bar) can be twisted to a maximum angle of 24°. Maximum torque load is 60,000 in.-lb, obtained by applying a 12,000-lb tension load. The new Schaevitz torsion device is furnished with hardened socket liners for specimens $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ in. square or for round specimens with square ends of these sizes. Other sizes of liners are available on special order. *Baldwin-Lima-Hamilton Corp.*

For more data circle No. 36 on postcard, p. 69.



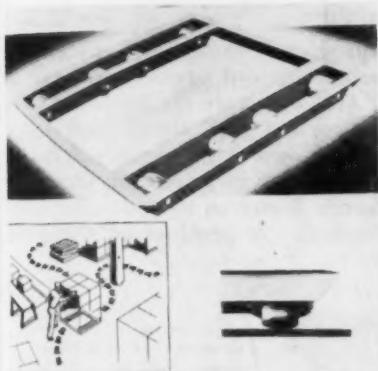
New Equipment

Continued



Pallet roller

Ace Swivel King pallet rollers permit effortless movement of palletized loads in any direction and to any location needed. They speed up material flow and product movement. King size rolls are heavy gage, large diameter, have crowned ends for free rolling and floor pro-



tection. Bearings are heavy duty, fully lubricated. Equalizer design retains the correct parallelism and alignment of frame under all load and floor conditions. *Frank L. Robinson Co.*

For more data circle No. 38 on postcard, p. 69.

Sequence control

Multiple sequence control of manufacturing processes is possible with a new electronic predetermined counter. Increased production and reduced spoilage are achieved because it is possible to govern the operation of production machinery in terms of lineal measurement, shaft revolutions, quantity, volume, or weight at operation speeds as high as 60,000 per min. Counters are available for one or more sequences. Each channel may be preset for any number from 0 to 9,999. *Potter Instrument Co., Inc.*

For more data circle No. 39 on postcard, p. 69.

Multi-drum barrel for small parts finishing

Where parts are small or production runs are limited, finishing barrels for deburring and burnishing have been designed with four removable tumble-drums. Four different pieces can be finished at the same time with different types of finishes. Any drum can be removed for filling and emptying while the

remaining drums continue to operate. Tumble drums have perforated sides for wet tumbling or solid sides for dry or wet tumbling. Rubber linings for solid sided drums permit ball burnishing. Models come with electric motor and starter switch. *Preakness Corp.*

For more data circle No. 37 on postcard, p. 69.

WEBB PLATE FABRICATING MACHINERY

Steelworkers ALL STEEL CONSTRUCTION

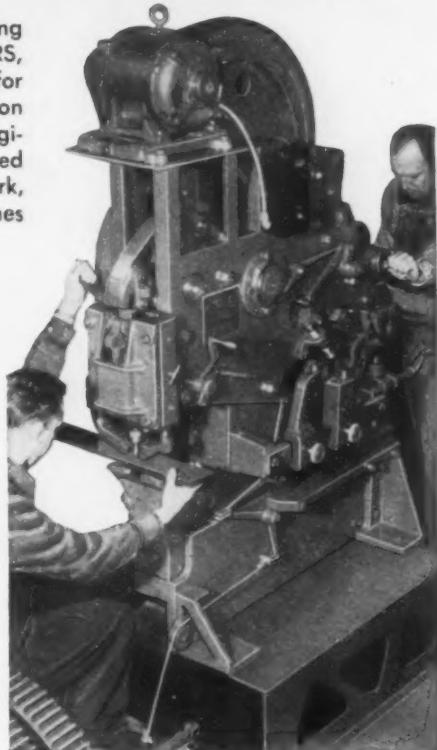
The Webb Corporation, in presenting the line of new WEBB STEELWORKERS, has designed versatile machines for either job-work or high production work. These units have been engineered to meet the particular need of shops having a variety of work, with a result that all-purpose machines are now available.

Five Complete Tools are Incorporated in a Single Unit.

1. Punch for plate, bars or structural.
2. Cuts angles and tees with straight or miter cut.
3. Cuts off round and square bars.
4. Shears plates and bars.
5. Coping or notching attachment.

One of the main features of these machines is that they are at all times in complete readiness to do any of the above operations and to do the work well.

The punch may be operated at the same time as either the section cutter, bar cutter, shear or the coping and notching attachment . . . therefore, two operators can work at this machine simultaneously without interference. For illustrated literature and prices, write Dept. E.



Let Speed PAY-The WEBB Way!



SLIP ROLLS



PYRAMID TYPE ROLL



INITIAL TYPE ROLL

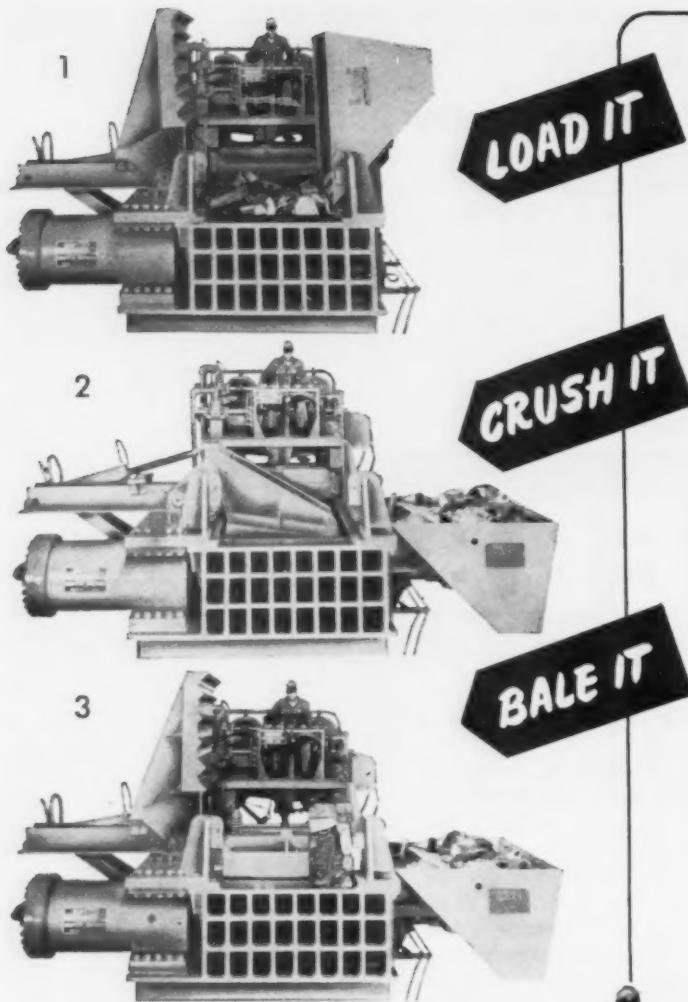


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FOR FAST, CONSISTENT, MORE
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The Dempster-Balester's "Load It—Crush It—Bale It" hydraulic action assures you of the fastest scrap metal baling operation . . . the closest approach yet to automatic baling!

It's a simple 1-2-3 continuous operation . . . Skip Pan Loader loads charging box. As Skip Pan returns to re-loading position, Auxiliary Compression Door compresses scrap with a 45-ton force. As Compression Door returns to up-right position, charging box closes . . . scrap is baled and ejected. Skip Pan has been re-filled and is ready to re-load charging box as soon as bale is ejected. As each cycle ends, another begins . . . Load It—Crush It—Bale It—Load It—Crush It—Bale It . . . one bale after another.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from . . . three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour. Write to us today for complete information. A product of Dempster Brothers, Inc.

Shown below is a three-quarter view of the Dempster-Balester Model 600. All hydraulic assemblies are integral to the machine itself.



DEMPSTER BROTHERS
383 Dempster Bldg., Knoxville 17, Tennessee

The Iron Age

SALUTES

Ivan L. Wiles

Head of GM's aggressive Buick Div., he is one of the auto industry's best liked executives.



GENIAL, scholarly Ivan L. Wiles is an automotive executive's executive. As general manager of General Motors' Buick Div. he heads one of the most aggressive units in the industry. But he does it in a manner that has made him one of the industry's most respected and well liked figures.

Ivan is one of a few top industrialists who can wear a Phi Beta Kappa key, which he earned at Wabash College, Crawfordsville, Ind. He started his business career as an accountant and still keeps a calculator on his desk for a fast check of costs and percentages.

He is one of the most friendly executives in industry, and his memory of names and faces is phenomenal. He commands respect without throwing his weight around and his success is reflected in Buick's fourth position in the industry and as GM's second biggest money making division. He has put Buick solidly in consumer preference and has pushed a high priced car into selling at the volume of the low priced.

Ivan is the trim athletic type and an accomplished pilot, a skilled sailor and an average golfer. He is a member of a number of clubs in his and Buick's home town of Flint as well as Detroit.

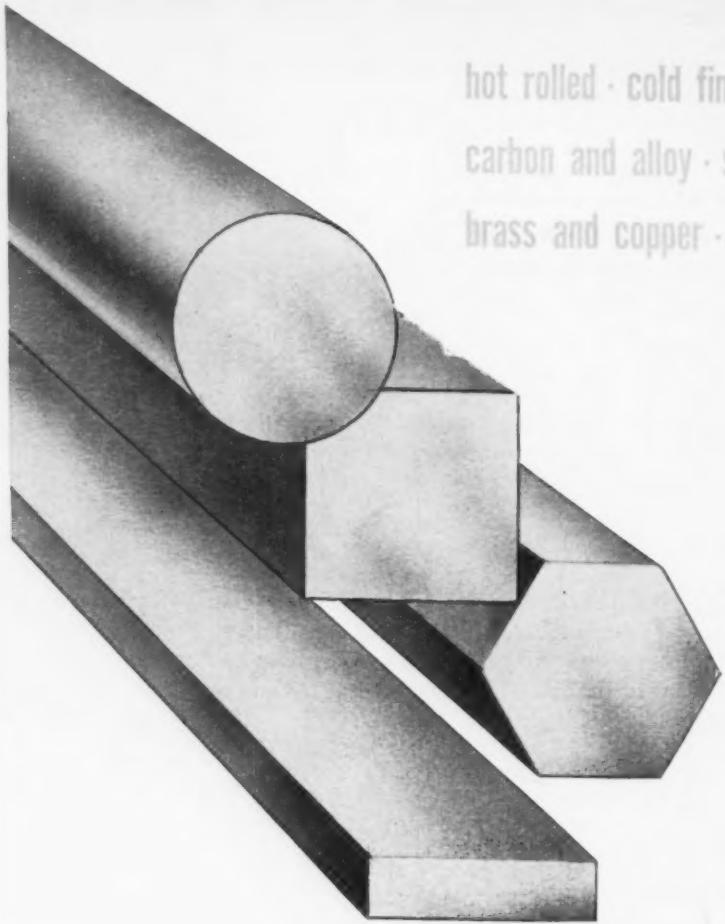
He started in the auto industry with the old Marmon Automobile Co. and reached Buick in 1932 as assistant comptroller. Ivan was comptroller when Harlow H. Curtice was Buick's general manager, succeeded his boss in 1948.

He pushed Buick's production over the 500,000 mark and has set 750,000 as his goal by 1960. Around Detroit it is doubted if Ivan will be on the scene at that time. Instead he will probably join the higher ranks on what is commonly referred to as "the 14th floor," with GM's hierarchy.

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The Iron Age

INTRODUCES

Robert E. Pearsall, elected president, JAMES McGRAW, INC., Richmond, Va.

George L. Noble, Jr., elected president, STANWELL OIL & GAS LTD.

Robert L. Westbee, elected vice-president, MINNESOTA MINING & MFG. CO., St. Paul.

Charles E. Greenlee, named assistant to the vice-president of sales, BASIC REFRactories, Inc., Cleveland.

John P. Kelsey, becomes vice-president and general manager, MID-AMERICA RESEARCH CORP.

Edward M. Pinsof, elected executive vice-president, SIPI METALS CORP., Chicago; Maury E. Lippert, becomes vice-president in charge of sales; Joseph Levin, made vice-president in charge of production.

George A. Krepps, named director of inspection, New Departure Div., GENERAL MOTORS CORP., Bristol, Conn.

Joseph J. Schofield, appointed corporate controller, GAR WOOD INDUSTRIES, Wayne, Mich.

John C. Guenther, made assistant director, technical information section, Engineering Div., CHRYSLER CORP., Detroit.

Robert B. Warnock, appointed director of sales, Birmingham Tank Co., division of INGALLS IRON WORKS CO., Birmingham.

Thomas J. Forbes, appointed to head of publications engineering, THE ENGINEERING & RESEARCH CORP., Riverdale, Md.

Ben S. Bland, appointed public relations director, DASHEW BUSINESS MACHINES, INC., Los Angeles.

David H. Paul, becomes abrasive engineer, Maryland and Delaware, NORTON CO. He succeeds Whitfield J. Bell, who will retire Sept. 1.

O. K. Irgens, appointed development and service chemist, Cleaner Dept., HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

F. Robert Preece, appointed district engineer, fabricated steel construction, BETHLEHEM PACIFIC COAST STEEL CORP., San Francisco.

Dr. Walter A. Donohue, becomes staff member for research in chemical engineering, Edison Medical Gas Div., THOMAS A. EDISON, INC., West Orange, N. J.

Clinton H. Johnson, named sales engineer, Electrostatic Precipitator Dept., KOPPERS CO., INC., Pittsburgh.

Robert Redfield, appointed chief engineer, Government Div., WEBSTER-CHICAGO CORP.

Henry J. Noebels, appointed head of the Applications Engineering Div., BECKMAN INSTRUMENTS, INC., South Pasadena, Calif.

Frank H. Roberts, appointed manager, Steel Dept., PEDEN IRON & STEEL CO., Houston, succeeding R. L. Phillips, who has resigned. Herman A. Bartlett, promoted to chief engineer, reinforcing section, Steel Dept.

Fred Kaiser, appointed manager, Eastern region, MINNEAPOLIS-HONEYWELL REGULATOR CO.

W. E. Doersam, appointed manager, Parts Dept., CATERPILLAR TRACTOR CO.; M. D. O'Byrne, becomes manager, York parts office Div.; and R. W. Cooper, named manager, York stores Div.



CHARLES A. MACFIE, elected president, Revere Copper & Brass Inc., New York.



JOHN D. TEBBEN, elected president and chairman of the board, Wagner Brothers Equipment Co., Wayne, Mich.



JAMES M. KENNEDY, elected chairman of the board, and chief executive officer, Revere Copper & Brass Inc., New York.

Personnel

Grayton F. Dressel, named production manager of Inorganic Chemicals, THE DOW CHEMICAL CO., Midland, Mich. He succeeds Ivan F. Harlow who will continue to serve as a production consultant.

L. F. Hollis, promoted to manager, Richmond, Va., branch of CRANE CO.

Tudor A. Wall, named manager, newly created Dept. of Industrial Development, KAISER STEEL CORP., Oakland, Calif.

Richard M. Donahue, named manager, Birmingham, Ala., plant, LINE MATERIAL CO.

E. J. Vargo, appointed assistant production manager, THE WELLMAN BRONZE & ALUMINUM CO., Cleveland.

Robert C. Hanna, manager of marketing, Component Products Div., GENERAL ELECTRIC CORP., Schenectady; and R. H. Jackson, made manager of sales, Apparatus Sales Div., southeastern district.

H. J. Holquist and E. J. Richardson appointed assistant managers, Cold Finished Bar Div., JOSEPH T. RYERSON & SON, INC., Chicago.

John L. Daniel, appointed public relations manager, Alumina plant, Baton Rouge, La., KAISER ALUMINUM & CHEMICAL CORP.

William I. Butler, named district manager, NEW YORK BELTING & PACKING CO.

Fenton Hall, appointed general sales manager of materials handling equipment, British Div., YALE & TOWNE MFG. CO.

Fred H. Johnson, named general manager, THE LUFKIN RULE CO. OF CANADA, LTD., Barrie, Ont.

Franklin W. Peters, appointed assistant general superintendent, Frick district, Coal Div., U. S. STEEL CORP., Pittsburgh.

Richard E. Hoierman, named advertising manager, Machinery Div., DRAVO CORP. and its subsidiary, Dravo-Doyle Co., Pittsburgh.



MASON PHELPS, JR., elected president, Pheoll Mfg. Co., Chicago.



EDWARD C. MYERS, appointed assistant vice-president, Industrial Relations Dept., U. S. Steel Corp.



WILBUR L. LOHRENTZ, appointed assistant vice-president, Industrial Relations Dept., U. S. Steel Corp.



WILLIAM E. MAHIN, appointed technical director, Vanadium Corp. of America.

since 1907

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*CONIFLEX BEVEL
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*Reg. U. S. Pat. Off.



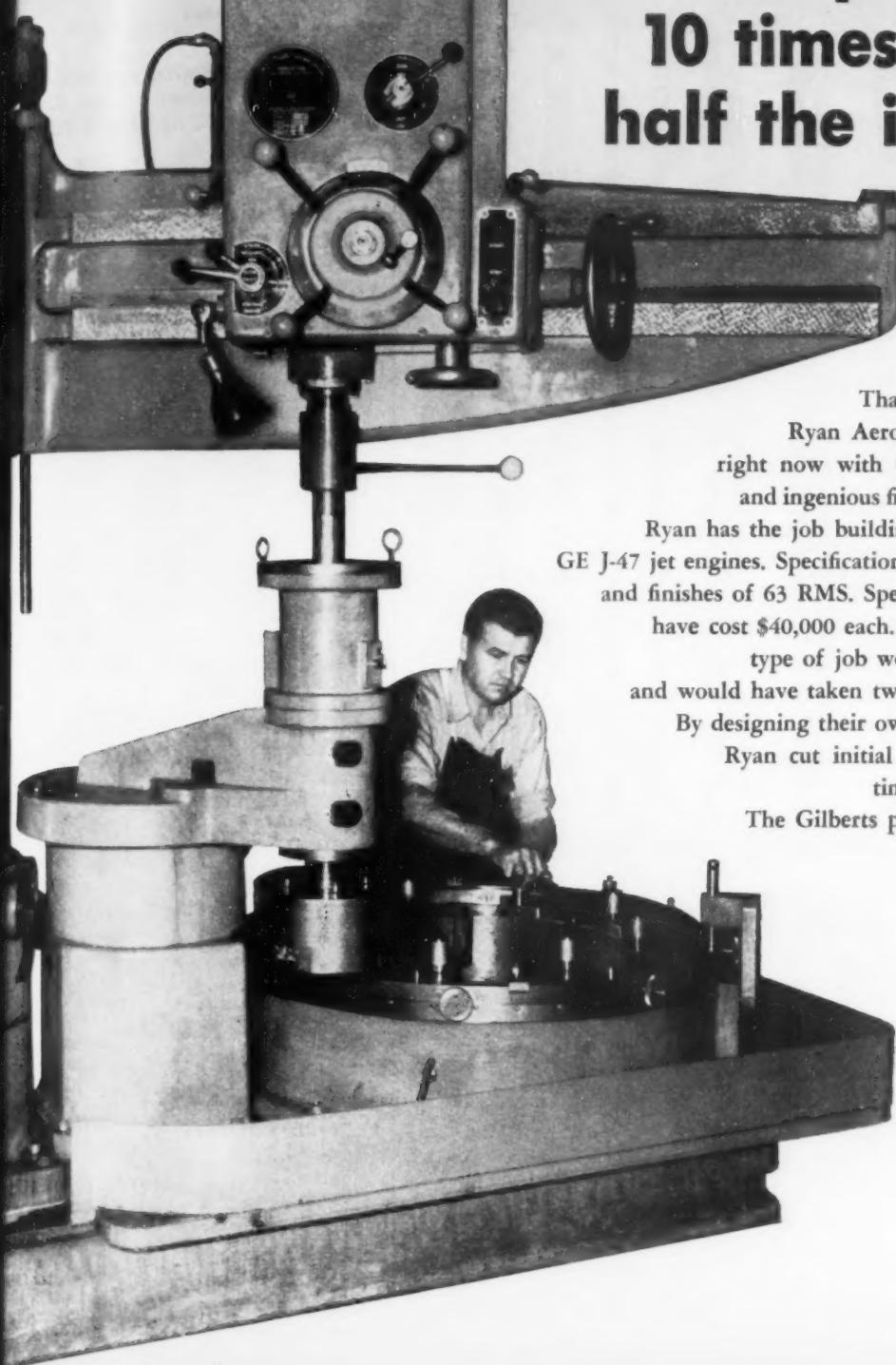
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That's quite a story. But it's true.

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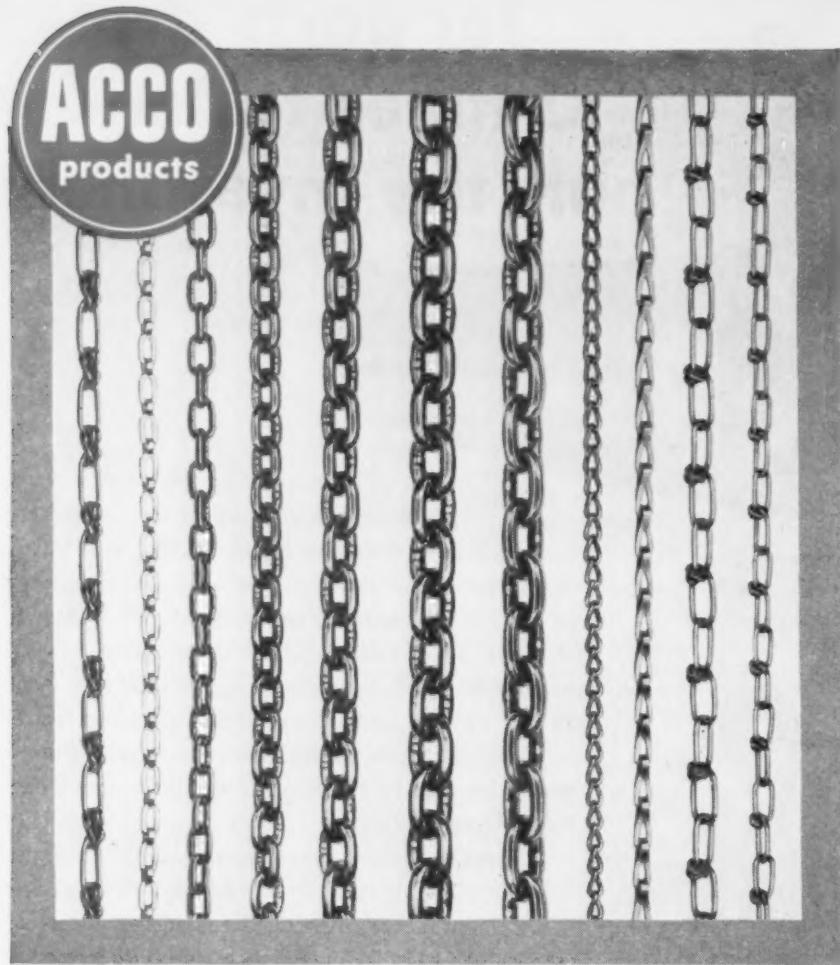
Ryan has the job building stainless steel aft frames for GE J-47 jet engines. Specifications demanded tolerances of .005" and finishes of 63 RMS. Specially-designed machines would have cost \$40,000 each. Conventional machines for this type of job would have cost equally as much, and would have taken two days to complete each frame. By designing their own fixtures to attach to Gilberts, Ryan cut initial investment in half, machining time from two days to *two hours*.

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Why does AMERICAN make All Basic Chain Patterns?

• Although two chains may look alike, their end uses differ, resulting in poor service if a substitution is made. For instance, the three heavy welded chains in the middle above appear almost identical except for size. Yet one is designed for general service where great strength is not required, one is for logging, while the third is for heavy duty service.

The same thing applies to the weldless chains. Take the two stamped, flat link chains: the safety chain near the left, and the sash chain near the right side. One has only to keep something from being lost; the other must carry weight and run over a pulley. Alike in looks, yes—but that's as far as it goes.

Probably we can suffice by saying—"AMERICAN makes all basic chain patterns so you can get the best (and most economical) chain for your every use."

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New York, Philadelphia, Pittsburgh, Portland,
San Francisco, Bridgeport, Conn.

**American
Chain**

Personnel

Continued

Clarence H. Smith, appointed assistant general superintendent, South Bend plants, STUDEBAKER CORP.

Chester D. Ware, becomes a heat transfer specialist in the development of new Trane Products, TRANE CO., La Crosse, Wis.

David J. Ryffel, named advertising manager, PRODUCTO MACHINE CO., Bridgeport, Conn.

David M. Davis, becomes sales representative, Cleveland area, SUPERIOR STEEL CORP.

Robert P. Schwing and **Edward R. Willerton**, named representatives, Middle Atlantic District, KENNA-METAL INC., and **William H. Hiltzbeitel** and **Samuel H. Jones**, become service engineers.

John J. O'Day, appointed sales representative, Detroit area, HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J.

Charles P. Egolf III, appointed sales and service representative, Florida, DIAMOND ALKALI CO., Cleveland.

OBITUARIES

George Brooke, retired vice-president, E. & G. Brooke Iron Co., Birdsboro, Pa., recently at Pennsylvania Hospital after an illness of several months.

L. M. Klinedinst, a former vice-president and director, The Timken Roller Bearing Co., Canton, Ohio, at Aultman Hospital in Canton of a heart ailment recently.

A. L. Beneke, secretary-treasurer, Wheeling Corrugating Co., Wheeling, W. Va., recently in the Ohio Valley General Hospital at Wheeling.

William J. Brewer, 56, director of purchases, Buick Motor Div., recently at McLaren General Hospital, Flint, Mich.

Ellwood C. Howell, 48, advertising and sales promotion manager, Carbonloy Dept., General Electric Co., following a heart attack.

Cut Engineering Costs With HIGH SPEED MOTION PICTURES



By A. E. Ground

Manager
Photographic Dept.
Lockheed Aircraft Corp.
Burbank, Calif.

- ◆ High speed motion picture photography can save time for your engineers, spot obscure causes of machine malfunctioning . . . Put to work at Lockheed Aircraft, this research tool has tackled such problems as operation of an impact extrusion press, a rivet machine, analysis of a flash welding problem.
- ◆ Specially designed cameras reach speeds of 6000 frames per second in 16-mm machines and 10,000 frames per second in 8-mm machines . . . A 100-ft roll of 16-mm film will record 4000 frames in $1\frac{1}{4}$ seconds . . . A special control panel starts lights, camera and, in some cases, machinery, simultaneously.

◆ HIGH-SPEED motion picture photography has given the research engineer a new tool for study of machine design and production problems involving movement of parts or machinery. Engineering and design problems are continually growing more complex as we design equipment that is larger or has a faster production rate. These factors, together with the present shortage of engineers, go hand in hand with the use of high-speed motion pictures to solve design problems.

Several design problems solved at Lockheed with the aid of this medium showed a saving of hundreds of manhours over "cut and try" methods.

In the conventional motion picture camera, film is advanced one frame at a time past the aperture by means of an intermittent claw mechanism. During the movement cycle the film is protected by a rotary shutter. The rotary shutter has an open segment, which exposes the

film during the stationary cycle. Due to mechanical limitations, the maximum speed of this type of camera is under 200 to 250 frames per second.

In the high-speed motion picture camera the film is pulled by means of a sprocket, past the aperture in a continuous motion. Each image is recorded by means of a rotating prism, traveling at the same rate of speed as the film. By this method speeds of 3000 to 6000 frames per second are obtained by two commercially available 16-mm cameras. Another model using 8-mm film can obtain speeds of 10,000 frames per second. In all cameras of this type these speeds are obtained by overvolting the drive motor to obtain maximum velocity as rapidly as possible. During the short time cycle required to expose 100 ft of film, this overvolting is not critical.

By means of variable voltage regulation the speed range of the camera can be slowed down to that required to photograph the operation under study. This allows a range of 750 pictures

Each 100-ft roll of 16-mm film will record 4000 pictures within 1 $\frac{1}{4}$ seconds . . . Electronic controls coordinate equipment . . .

per second to the maximum of (in our case) 3000.

Each 100-ft roll of 16-mm film will record 4000 pictures, and at maximum speed will record the process under study in 1 $\frac{1}{4}$ seconds. When reviewing the processed film the engineer can study the operation by using a conventional 16-mm projector showing these pictures at a rate of 16 frames or less per second. Some types of projectors allow the stopping of the machine for individual picture study.

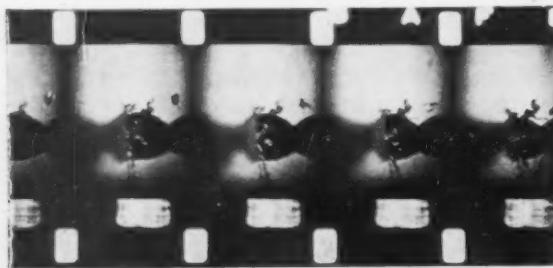
Lighting the subject was often a problem. Due to short exposures, a high light level is necessary. One lamp manufacturer developed an overvolted lamp designed for high-speed photography. Heat developed by this lamp would, under extended use, soon melt the glass case. Since the periods needed to light the subject were short, this problem did not arise.

Film recording cycle short

In reviewing film it is often desirable to know time intervals. The camera uses a neon glow tube flashing 120 times per second. Each of these flashes records as a pip on the edge of the film. By counting the number of frames between the pips, the rate of speed is easily calculated.

One of the commercially available cameras has recently added a second lens. This lens will record through a partially silvered mirror, traces from an oscilloscope as other instrumentation. Thus in addition to a photographic record of the action taking place, instrumentation curves are shown at the same time on the same picture.

At maximum speeds the film recording cycle is extremely short. To overcome this, our staff designed and built an electronic control cabinet. By this device, camera lights, camera, the subject to be photographed (if it can be started electrically) can all be started by pressing one button. The various circuits make it possible to set up any desired time delay for sequencing the operating cycle.



CHIP FORMATION can be studied frame by frame in this strip taken from high speed motion picture study of drill operation. Speed of film is calculated from a flash-timer.

High-speed motion picture photography has many industrial applications. Its unique feature of magnifying time allows records to be made of operations or objects in full scale operation that are too fast for the human eye to follow. The result can then be analyzed picture by picture. This type of photography has been found invaluable in studying the cutting action of lathe tools, milling cutters, path of coolant liquid over cutting tools and malfunctioning of machines.

During World War II, Lockheed was faced with a drill design problem. Breakage of drills, used to drill rivet holes on airplane skins, was abnormally high. A second problem was the necessity of deburring the hole on the opposite side of the skin. Engineers felt that a new drill design would solve both problems. Various new drills were made and photographed in action.

By studying the high-speed motion pictures, engineers could observe the cutting action of the drill starting into the skin, the chip formation and the point of the drill emerging through the skin on the opposite side. As soon as the problems were seen, engineers were able to design a drill to solve both conditions.

Lockheed has several machines for making aluminum rivets from aluminum wire. One machine had a high rejection rate due to smashed and misformed rivets. It had been carefully checked and was apparently identical to



SMASHED AND MISFORMED aluminum rivets were traced to defect in rivet machine. High speed pictures showed pall did not seat properly on ratchet in some cycles.

the other machines. High-speed motion pictures revealed that a weak spring was causing a pall to seat improperly on a ratchet during some cycles. This caused malfunctioning.

Use of color film provided the solution to a flash welding problem. It was desired to preheat the ends of two thin-walled steel tubes by a high amperage current. The two ends were then rapidly pushed together and welding current applied in the presence of a gas flow to prevent oxidation during the weld. This method would weld the tubes together without appreciably increasing the wall thickness at the weld. Certain areas, however, did not weld properly.

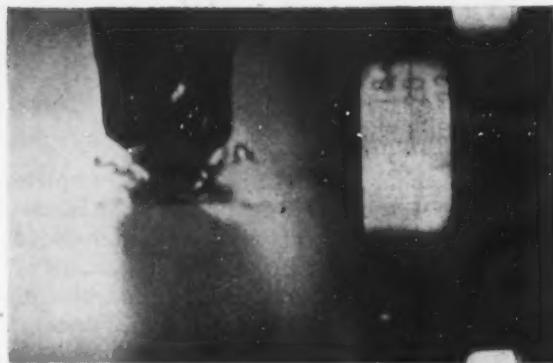
Black and white high-speed motion pictures did not show too much so color film was tried. Ordinarily color film is far too slow for use with the high-speed camera. The intense light developed during the weld, however, made its use possible in this case. By watching the color change in the high-speed motion picture film, engineers were able to determine the areas in the weld that were cooling too rapidly, preventing a homogeneous weld. This color change was not indicated on black and white film.

Often the high-speed camera reveals conditions not suspected by designers. This occurred in a landing gear functional testing study. In this problem a complete airplane was hoisted from the ground and allowed to free drop at increasingly higher distances until landing gear failure was obtained.

Chief concern was with vertical and forward stress. After a study of high-speed motion pictures, it was found that at the moment of impact there was a twisting force on the wheels, which



HIGH SPEED PHOTOGRAPHY has proved especially helpful in study of lathe tools. Here Lockheed technicians make a typical setup. Action of milling cutter was also studied.



BLOWUPS OF SHOTS taken fractions of second apart. At top, drill starts cutting action as it enters metal surface. Above, drill has entered metal and long chip rolls out, left, while chips begin to pile up at right. Below, chips fly as drill continues down into metal. Time, right, and neon flow tube which flashes 120 times per second, help calculate rate of speed.



Too much slack in plunger and die showed up when impact extrusion failures were studied . . .

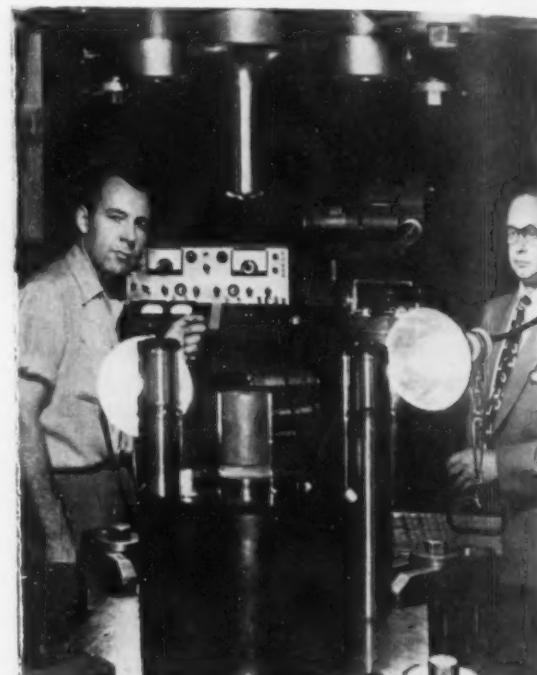
had not been suspected. This caused a complete redesign of the landing gear at the initial design stage. Lockheed engineers used high-speed motion pictures in developing a new method of impact extruding aluminum. A round billet of aluminum was placed in a die and struck by a punch. The heat and impact caused the aluminum to flow around the punch, forming, according to theory, a closed tube of equal wall thickness.

Using existing presses this method of forming was tried experimentally. It was found that the top part of the formed tube was of greater thickness than the remaining portion. Many theories and experiments failed to give the answer and the high-speed camera was used.

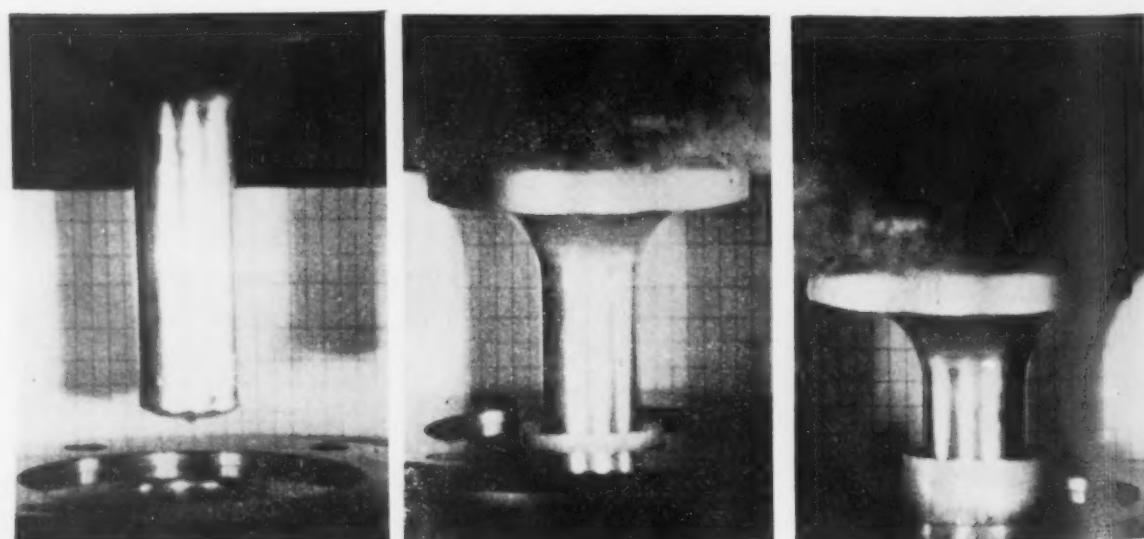
When the film was analyzed it became apparent that the problem was caused by an undue amount of slack in the plunger and die. This slack, at the moment of impact, allowed the punch to slow down, causing excessive wall thickness at that point. As a result of these studies, an impact extrusion press was designed and ordered from the manufacturer.

After the equipment was installed, further motion picture studies showed a certain amount of side-to-side movement in the punch as it descended. Accordingly the punch was marked with horizontal reference marks and large face dial indicators were installed to record deflection during the stroke. The sweep of the indicator dials was so rapid it was impossible to read except by means of analyzing the film frame by frame.

Many studies have been made on flight problems, ballistics and missile work. Nearly every major problem solved by high-speed motion picture photography has saved the initial cost of the equipment many times. It has reduced design time by hundreds of manhours and has saved many hours of production time by returning shop equipment to production faster.



UNDUE SLACK IN PLUNGER and die resulted in imperfect parts from this impact extrusion press. Side movement of punch was also noted in film frames. Electronic equipment, background, triggers lights, camera, and in some cases machinery, at same time.



STEPS IN FORMING aluminum impact extrusion. Slug is in die as punch descends, left.

Metal flows up around punch, center and right, as the punch progresses downward.

Deep-drawn magnesium—

Trim Flanges Faster On Shaper

♦ NOVEL APPLICATION of a light, inexpensive power tool is helping the Magnesium Co. of America meet production goals at its East Chicago, Ind., plant. Magcoa supplies magnesium boxes for electronic equipment. Made of FS alloy magnesium sheet, the box is 10 in. long, 6 in. wide, and $10\frac{1}{4}$ in. deep and has $\frac{1}{2}$ in. inside corner radii.

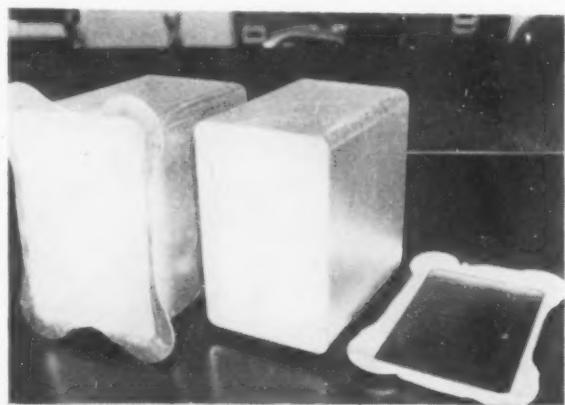
The box is deep-drawn in one operation on a hydraulic press. When taken out of the press, the box is flanged along its open side. This flange is trimmed off with a standard Delta shaper. The same operation is performed on covers for the boxes.

Choice of a shaper to trim the flange is unusual. This operation normally would be handled by a router or a milling machine. However, the company has discovered that the Delta shaper does a fast, efficient job at less capital expense.

Interesting feature of the operation is the high speed at which the shaper is operated. Normally, metalworking machines are assumed to operate at comparatively slow speeds. In this

case spindle speed is in the 10,000 rpm range.

The shaper is equipped with a soft steel blade with carbide tips to prevent disintegration at high speeds. When the box is being trimmed, side clearance is kept high to avoid friction and uneven trimming. The shaper holds tolerances on trimmed height to ± 0.005 in. Air cooling has proved to be sufficient; no coolant or lubricant is used.



BOXES, DEEP DRAWN from FS magnesium alloy, are 10 in. long, 6 in. wide, $10\frac{1}{2}$ in. deep.



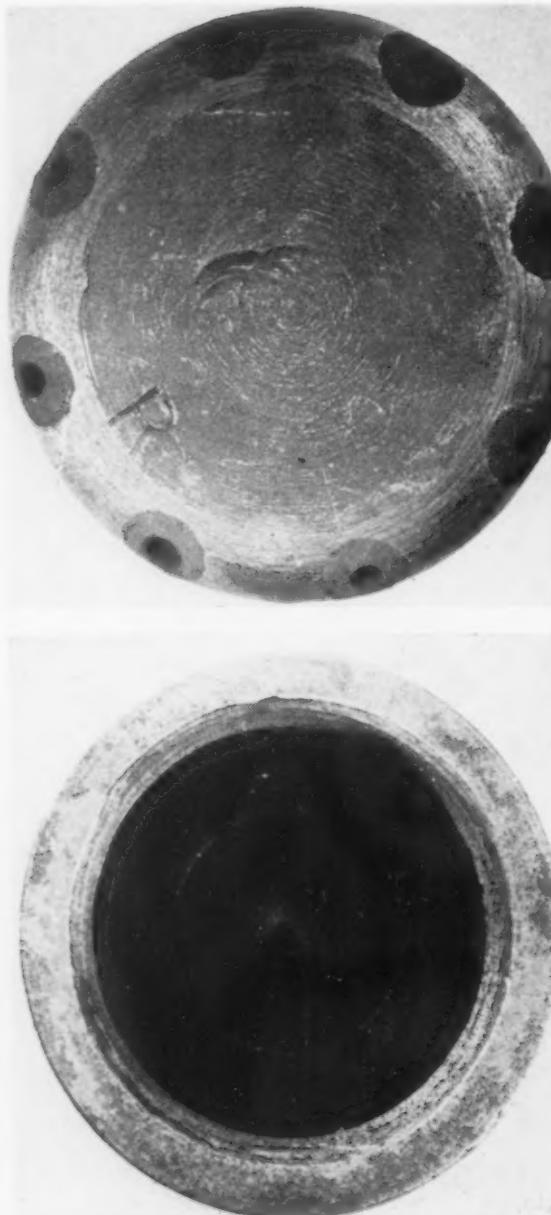
MAGNESIUM COVERS and boxes for electronic equipment are trimmed to size fast using low-

cost Delta shaper in this setup at the East Chicago, Ind., plant of Magcoa.

Prepared for plating—

GUN BARRELS DEBURRED

By W. G. Patton
Assistant Technical Editor



EXTERIOR AND INTERIOR (above and below)
high pressure nozzle for liquid honing. Rubber
insert resists wear.

♦ Liquid honing has proved an effective means of removing burrs from the interior of 90 mm tank cannon at Oldsmobile.

♦ Blasting with fine grit suspended in water also cleans the interior surface of the gun and improves surface finish prior to chromium plating.

♦ DEBURRING and cleaning the rifled gun barrel of a 90 mm tank cannon is accomplished in 45 min at Oldsmobile Div., General Motors Corp., by liquid honing. In addition to removal of burrs, the irregular inner surface of the gun is prepared for chromium plating which resists wear and adds appreciably to the service life of the gun.

A liquid containing a mixture of No. 145 and No. 320 silica grit suspended in water is applied under pressure of 100 psi. Approximately 2 lb of 320 silica grit and 1 lb of 145 grit are added to a gallon of water. A wetting agent and a rust inhibitor are also added to the solution.

The photos at the left show exterior and interior views of the spray nozzle employed for this operation. A rubber insert having eight holes $1/16$ in. in diam is press-fitted into the nozzle to resist wear. After the holes become elongated as a result of abrasive action, the nozzle is replaced. As shown, the nozzle screws on the end of a steel tube.

The spray nozzle oscillates during the blasting operation, assuring uniform surface coverage. Forward speed range of the nozzle is 1.25 to 5.17 fpm. A rate of 1.25 fpm is generally used at Oldsmobile for grit blasting.

Average life of a nozzle is about 10 guns before replacement is necessary. During service the holes become enlarged, resulting in nonuniform feeding of the abrasive-containing liquid. New rubber inserts are placed in the steel nozzles before returning them to service.

Liquid honing is applied to the interior of the guns over their entire length and to the face of the gun at the breech. The muzzle end of the gun is by-passed.

Equipment used by Oldsmobile (right), was designed by Vapor Blast Co., Milwaukee, Wis., particularly for this operation. In the upper photograph, the blast operation is just beginning. The chain-driven feeder tube has entered the gun and blasting has started. The oscillating tube, supported by three steady rests, moves forward at a rate of 1.25 fpm. Spent abrasive mixture flows down the gun barrel or down a catch trough into the settling tank. The tank is equipped with baffles to facilitate the settling operation.

DEBURBED AND CLEANED BY LIQUID HONING

At Oldsmobile the 50-gal settling tank is completely emptied each week after 80 to 125 hr operation. A 100 pct new solution replaces the old solution. In addition, a small amount of makeup grit is added each day.

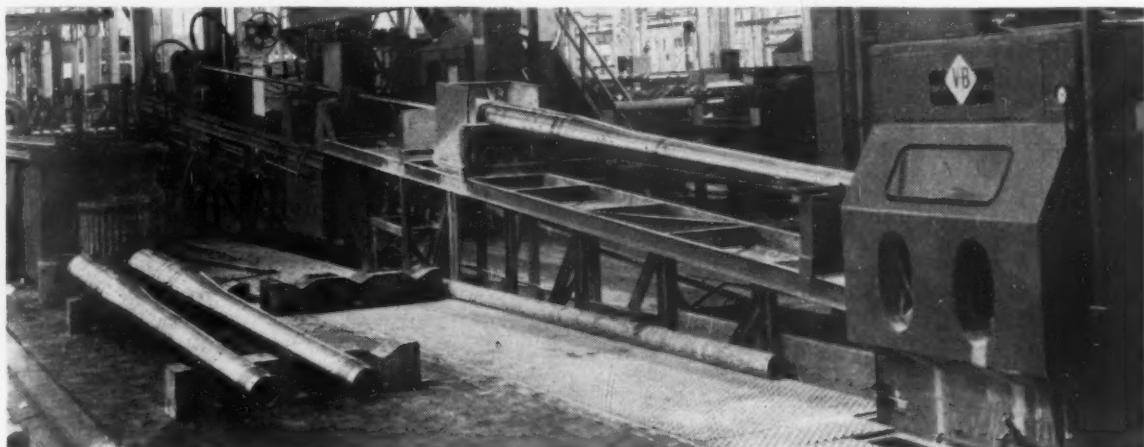
Following the abrasive blast, the spray operation is repeated with clean water. This removes any clinging abrasive. Forward speed of the oscillating nozzle during this operation is 5.17 fpm.

A closeup of the valve control system and the pressure pump system is shown below the general installation view. Valves at the left center control the flow of abrasive-containing liquid or clear water. At the start of the blasting operation, the system is permitted to run at low pres-

sure until the abrasive content of the mixture reaches the desired uniformity. The full pressure blast is not turned on until the nozzle is in position inside the gun.

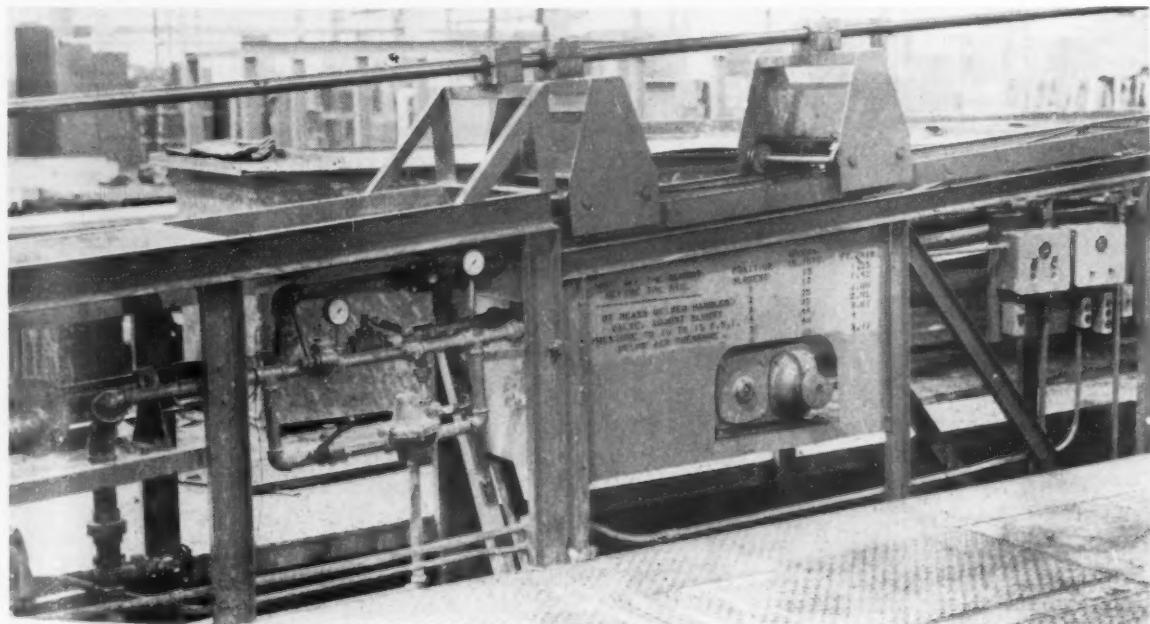
Because of the highly abrasive nature of the liquid employed for blasting, considerable maintenance is necessary. The main pump shaft is replaced approximately every two weeks. Rams and connections at the head of the ram must be replaced about once a month. Operating experience at Oldsmobile shows it is desirable to rebuild the pump after 125 to 50 hr operation.

The equipment at Oldsmobile has been operating for more than two years and has provided an effective and efficient method for deburring and cleaning 90 mm gun tubes.



START of the blasting operation. A chain-driven, oscillating tube supported by three

steady rests moves forward at a rate of 1.25 fpm inside the gun tube.



CLOSEUP of the valve control system and the pressure pump system.

Toughness v. wear resistance—

How to Get More From Your TOOL STEELS



By L. H. Seabright
Metallurgical Engineer
Acme Steel Co.
Chicago

◆ TOUGHNESS AND RESISTANCE to wear play a related and vital part in tool life. No single test type of test can define the usefulness of a steel or treatment. Therefore, to properly evaluate tool steels for a particular application it is necessary to select a toughness test which closely parallels service requirements.

A case in point was the difficulty experienced some years ago with air-driven torque screwdriver tips. Screwdriver tips from all except one source were snapping off from the twist required on the tip. The stronger tip was found to be a silico-manganese steel while the other tips were either carbon or carbon-vanadium steel.

A small amount of reserve plastic deformation before the tool breaks is needed. As hardened, the silicon-manganese steel will be able to stretch about 4 pct before breaking. This reserve allows slight plastic adjustment to level out the load distribution and avoid the formation of a crack which intensifies the stress concentration

- ◆ When you pick a tool steel for that next tooling job, bear in mind that the tests for basic physical properties must parallel tool service requirements to be of value . . . When you have to decide on toughness v. wear resistance, remember too that no one test gives all the answers.
- ◆ Here, for your convenience, is an evaluation of testing methods as applied to tool steels . . . You can expect and get more from your tool steels by applying the knowledge gained in recent studies of heat treating methods.

causing failure of the tip. Relative toughness is apparently therefore the product of load on strength times deformation.

A variety of tests are used to determine toughness, usually measured in foot pounds, in tool steels. Each has merit for certain applications.

The Charpy and Izod impact tests hold the sample in a vise or clamp and allow a heavy pendulum to swing against it. The weight of the pendulum times the vertical drop required for breakage gives a foot-pound measure of toughness.

While no precise stress analysis can be shown for these impact tests, maximum normal stress developed for unnotched specimens is greater in comparison with the shearing stress than it would be in a tension test.

If the cohesive strength of a steel sample were over twice its shearing strength, it would be brittle in this test and relatively ductile in the

TABLE I PRIMARY TOOL STEEL REQUIREMENTS

Application	Where Movement in Hardening is Unimportant (Water-Hardening Steels)	Where Movement in Hardening is Important (Oil-and-Air-Hardening Steels)	Where Resistance to High Temperature is Important (High-Speed and Hot-Work Steels)
Maximum wear resistance	Group 1	Group 5	Group 9
General cutting tools	Group 2	Group 6	Group 10
General die work	Group 3	Group 7	Group 11
Maximum toughness	Group 4	Group 8	Group 12

torsion test. A disadvantage of this test is that the foot-pound result gives only the total energy required for deforming and fracturing the sample. It does not indicate the energy absorbed up to the inception of a crack.

Notching of impact test specimens produces a different pattern of stresses for every different notch. An increase in the depth or severity of a notch increases the ratio of cohesive stress to the shearing stress. Most of the impact test data given for tool steels is for unnotched samples except for the toughest groups of steels.

Torsion tests, widely used by tap and drill makers, can be used to measure both the strength and ductility of tool steels especially since these steels are characterized by high strength and low ductility. A stress-strain curve is plotted by recording the angle of twist for each increment of torque until rupture occurs. From this data information on elasticity, plasticity and ultimate torsional strength is obtained.

Analysis of the stress system set up in the torsion test shows that the maximum normal stress developed is equal to the maximum shearing stress. Therefore, if the cohesive strength of a material were $1\frac{1}{2}$ times the shear strength, the material would still be ductile in this test.

This test indicates peculiar high toughness values for certain tempering treatments where they are not shown by other test methods. The fact that these high peaks are followed by lower toughness values at a lesser hardness would

seem to indicate a micro-structural change at the point.

The bend test on unnotched bars is receiving increasing attention as a means of indicating elastic and plastic properties of hardening tool steels. In the bend test, the ratio of maximum normal stress causing fracture to the maximum shear stress causing flow is about 2 to 1.

Strain readings (in terms of deflection) are recorded for each increment of load at constant rate until fracture occurs. The ultimate fiber stress in tension can be calculated from the load at fracture and the dimensions of the specimen. Stress-strain curves can then be drawn from the load deflection curves. It is also possible to determine the modulus of elasticity and yield properties of the steel.

Test results are shown for the effect of tempering temperature on bend and yield strength for two common high speed steels, Figs. 9 and 10. These are shown plotted along with the hardness and Izod impact strength curves for comparison.

In the Chambers¹ system for classifying steels according to their "wear-toughness ratio," tool steels were arranged according to the basic requirements for the desired tools. Mechanically, there are four fields of application: (1) 0.65 to 2.50 pct carbon for wear-resisting tools; (2) 0.25 to 1.55 pct for general cutting tools; (3) 0.25 to 1.50 pct for general die work; (4) and 0.25 to 1.00 pct for shock-resisting tools. These four major groups were classified according to hardening requirements and resistance to elevated temperatures, Table I.

To make this classification practical and sim-

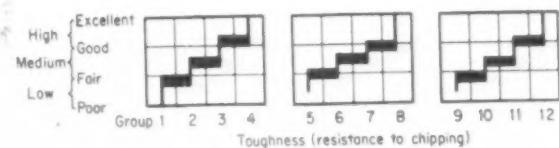


FIG. 1—Variations in toughness for the basic tool steel groupings.

TABLE II COMPOSITE CHEMICAL ANALYSIS OF STEELS IN EACH GROUP

Group	C, pct	Mn, pct	Si, pct	Cr, pct	W, pct	V, pct	Mo, pct	Co, pct	Ni, pct
1	1.25-1.50	0.15-0.50	0.15-0.75	0.0-1.00	0.0-6.00	0.0-0.35	0.0-0.50		
2	1.10-1.50	0.15-0.50	0.15-1.00	0.0-1.20	0.0-2.50	0.0-0.30	0.0-0.30	(Al 0.0-0.25)	
3	0.90-1.10	0.15-0.35	0.15-0.50	0.0-1.50	0.0-2.50	0.0-0.50			
4	0.45-0.90	0.15-1.00	0.15-2.25	0.0-1.20		0.0-0.35	0.0-0.60		0.0-0.50
5	1.00-2.50	0.15-1.20	0.15-1.10	10.50-14.00	0.0-2.00	0.0-1.25	0.0-1.50	0.0-4.00	0.0-1.00
6	1.10-1.30	0.15-0.95	0.15-0.35	0.25-1.75	0.0-2.50	0.0-0.40	0.0-0.75		
7	0.70-1.50	0.30-3.25	0.15-1.40	0.0-5.50	0.0-1.10	0.0-0.50	0.0-1.75		0.0-2.00
8	0.40-0.90	0.15-1.25	0.15-2.25	0.0-2.00	0.0-3.00	0.0-0.60	0.0-2.20		0.0-2.50
9	0.65-0.95	0.15-0.35	0.15-0.50	3.5-4.75	0.0-23.00	0.75-3.00	0.0-10.00	2.0-15.00	
10	0.55-1.55	0.15-0.35	0.15-0.75	3.5-4.75	0.0-21.00	0.50-5.25	0.0-9.50	0.0-5.25	
11	0.25-0.65	0.15-0.75	0.15-1.75	1.25-7.20	0.0-19.00	0.0-1.25	0.0-9.00	0.0-2.00	0.0-3.00
12	0.25-1.00	0.15-1.35	0.15-1.35	0.50-7.50	0.0-4.25	0.0-1.15	0.0-3.00	0.0-0.60	0.0-5.00

Drawing temperatures for tools subject to torsion should aim at the peak of the torsion impact curve if hardness is satisfactory . . .

plify identification, a complete chemical analysis of the steels falling into each group has been made, Table II. These main groups have been further broken down into 45 types according to their analyses.²

Chambers illustrates the variations in toughness for the different groups. It is interesting to note how accurately the relationships have been verified by results run many years later, Fig. 1. References such as 5C, 7A, etc., refer to subgroups in this system.

Impact test data, available on most tool steels, place the steels listed in roughly the same position shown in the wear-toughness classification. Test results given by other methods also place the steels in approximately the same relative order.

Results obtained for different tempering treatments, however, as revealed by torsion and impact tests, are very dissimilar. This fact is associated with the differing effects of the tempering treatment on the strength characteristics of the steel. Impact test results are shown here with results from other testing methods so that they may be more easily compared.

For the impact test results on the water hardening steels, Figs. 2 and 3, there is a gradual increase in toughness shown with rising tempering temperature. According to the torsion impact test results, toughness increases as would be expected with increasing drawing temperatures to a maximum for a drawing tem-

perature of about 350°F. Upon drawing at a temperature above 375°F the toughness falls off until a temperature of about 475°F. Above this, toughness again increases.

The torsion impact test seems to have most significance when used with steels which are so hard they will break before they will bend appreciably. When these steels are drawn above 500°F they bend quite a bit before breaking. Therefore, it does not seem wise to conclude that this steel is tougher when drawn at 375°F than when drawn at 700°F. It just requires more energy to twist off the torsion impact specimen at the lower drawing temperature. This is important in determining the optimum heat treatment for drills and taps.

Must bend before breaking

The conception of toughness, however, involves the idea that a piece that will bend before breaking is "tougher" than a piece that will break before bending. A tool containing a sharp notch, as a tap, requires a harder blow to break when drawn at 700°F than when drawn at 375°F. This is because the higher drawing temperature leaves the steel in a more ductile condition. Torsion impact toughness is really a combination of ductility and strength. Since drawing temperatures above 500°F would seriously impair wear resistance, a steel should be selected from a different group if greater toughness is required.

This principle applies for all groups in the wear-toughness ratio classification. In the use of wear resisting steels they should only be drawn down to the point where the next tougher steel is able to pick up the job. Tools subject to torsion in service should be drawn at the temperature for the peak of the torsion impact curve, provided that this draw produces hardness within the desired range.

Finding "best" heat treatment

An interesting series of tests was run on the impact strength of high carbon, high chromium steels by the Latrobe Electric Steel Co. These tests, shown in Figs. 4, 5 and 6, were carried out on the Izod tester while other impact tests shown were run on the Charpy tester. Therefore, they are comparable with each other but not with results from steels tested on the Charpy tester.

The test results show that the steel Select B (7A) is substantially tougher than either Olympic (5C) or GSN (5A). They also show that Olympic is tougher than GSN as would be expected by its position in Group 5. In comparing these results with those obtained by the Carpenter Steel Co. on steels of similar anal-



SETTING UP Izod impact test for tool steel.

ysis, the same relative toughness of the steels can be noted, Fig. 7. However, when the tests are run on the torsion impact tester the impact strength maxima occur in different places than for the Izod test results.

The tempering curves for these steels exhibit a secondary hardness hump. It is at this point where the Izod impact test results are a minimum, while the torsion impact results show a minimum slightly beyond this point. From these results optimum heat treatment for the best compromise between wear and toughness may be obtained for particular applications, Fig. 8.

The "Desegregating" process developed by Latrobe is intended to promote uniform carbide distribution. It is interesting to note how much improvement in impact strength can be realized by controlled uniformity of carbide distribution.

Bend and yield strength

Bend test results were run on two high speed steels by Roberts and Grobe³. The steels used were the 18-4-1 (10C) and 6-5-2 (10E) types. Bend strength and yield strength results are plotted against tempering temperature in Figs. 9 and 10. This series of tests was run to determine the effect of austenitizing temperature as well as tempering temperature on the bend strength and yield strength of the steel. Impact test results are shown in Fig. 11 so these steels may be compared with other high speed steels.

The test results show that the yield strength of the 18-4-1 steel increases rapidly up to the nominal hardening temperature of 2350°F. But the bend strength increases only slowly in this range and passes a maximum between 2200° and 2300°F. The bend strength drops rapidly above 2350°F as the grain size of the steel increases and more carbides are dissolved.

To facilitate interpretation of the data, graphs showing the effect of tempering temperature upon the two strength properties and upon the impact properties of both steels are reproduced here for a tempering time of one hour.

In the as-quenched condition all properties are relatively low. However, as the martensite becomes tempered and residual stresses are lowered, deflection and strength increase on tempering up to about 550°-600°F. Above this temperature precipitation of the alloy carbides takes place from the residual austenite. The residual austenite is rendered capable of transforming to untempered martensite.

On tempering, the strength of the steel decreases up to 950°-1000°F while the deflection shows a minimum at 700°F as well as the minimum at the secondary hardness peak. The first may be associated with the initial stages of carbide precipitation which lower the ductility of retained austenite. The second is associated with the austenite-to-untempered martensite transformation.

In these tests, double tempering was found to

Water hardening steels showed a gradual rise in toughness with rising tempering temperature . . .

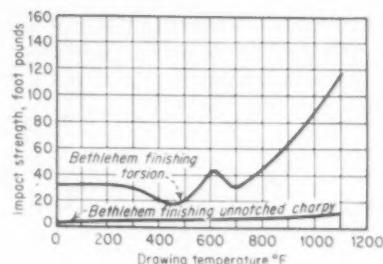


FIG. 2—Tungsten finishing steel, type 1A, water quenched from 1475°F.

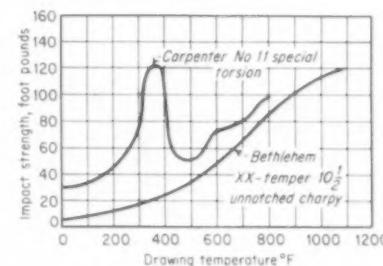


FIG. 3—Type 3C carbon tool steels compared in torsion and Charpy impact test.

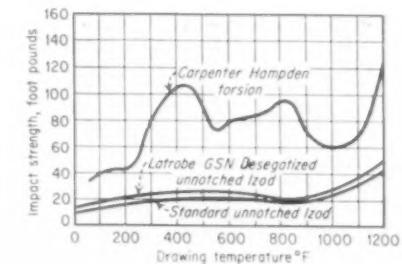


FIG. 4—High-carbon, high-chromium steel, oil quenched from 1750°F.

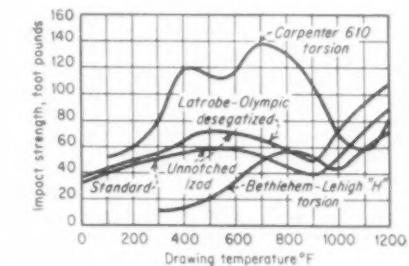


FIG. 5—High-Carbon, high chromium steel, type 5C, air cooled from 1850°F.

Since stress conditions in large tools are not duplicated in small samples, bend test has limits . . .

increase the bend test properties when the hardness was lowered by the second tempering treatment. However, the bend test cannot evaluate the beneficial effects of double tempering in altering residual stresses since the stress conditions existing in large or complicated tools cannot be duplicated in the small bend test specimen.

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- 1 Tool Steels Classified by Wear Toughness Ratio, Metal Progress, Vol. 37, No. 6, 665-670, 1940.
- 2 L. H. Seabright, "The Selection and Hardening of Tool Steels," McGraw-Hill Book Co., pp. 4-8, 1950.
- 3 A. H. Grabe and G. A. Roberts "The Bend Test for Hardened High Speed Steel" Transactions, American Society for Metals, Vol. 40, 149, pp. 435-490.

Acknowledgment:

The writer wishes to express his appreciation for data furnished by Atlas Steels, Ltd., Bethlehem Steel Co., Carpenter Steel Co., Latrobe Steel Co., and Vanadium-Alloys Steel Co.

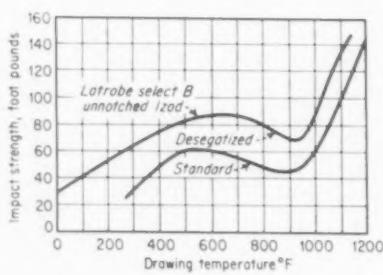


FIG. 6—Chromium-molybdenum tool steel, elbow type 7A, air cooled from 1750°F.

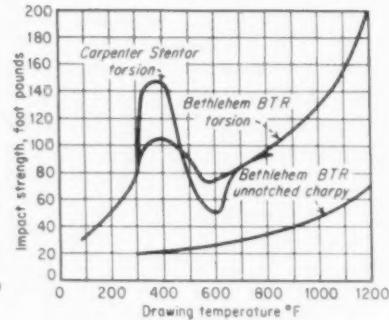


FIG. 7—Manganese nodeforming tool steel, type 7C, oil quenched from 1475°F.

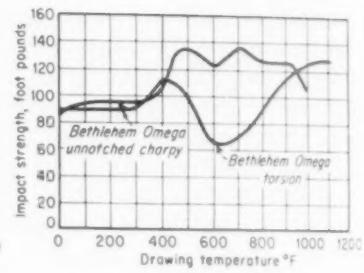


FIG. 8—Silicon-molybdenum steel, type 8D, oil quenched from 1600°F.

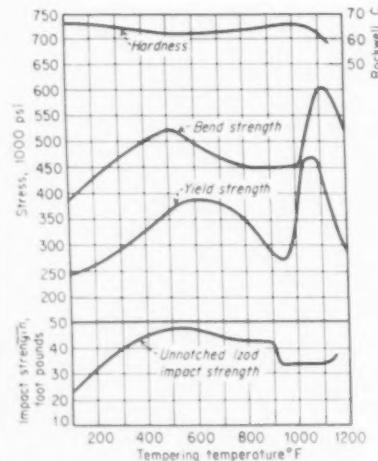


FIG. 9—Type 10C, an 18-4-1 high speed steel austenitized at 2350°F.

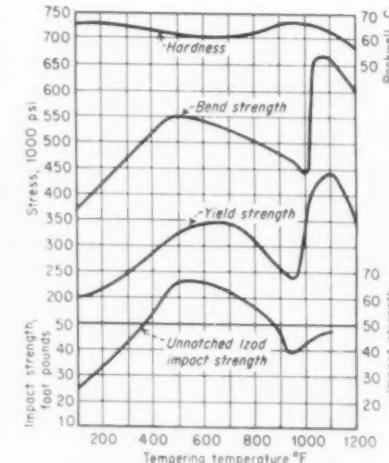


FIG. 10—Type 10E molybdenum-tungsten high speed steel austenitized at 2225°F.

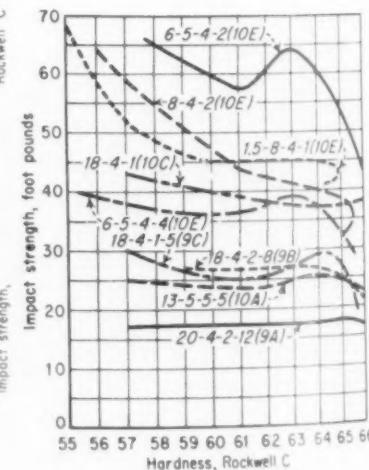


FIG. 11—Impact strength v. hardness of speed steels.

Diamond in the rough—

NEW MILL

Helps boost rod output



By John Delaney
Pittsburgh Editor

- ◆ Fast, easy roll changes and use of diamond and square rolling in the roughing stands are features of Jones & Laughlin's new rod mill . . . Top delivery speed is 5000 fpm . . . Since installation production has averaged 25,000 tons per month.
- ◆ Housings, of unique design, shift laterally to align groove and pass line . . . Each pair of eight stands in the roughing mill has a common drive . . . All six finishing stands are on a common drive.

◆ TWO FEATURES of the new rod mill at Jones & Laughlin Steel Corp.'s Aliquippa, Pa., plant are: (1) Ease and speed of roll changes; and (2) use of diamond and square rolling in roughing stands.

Although it is not a new technique, use of the diamond and square in the roughing stage has certain advantages over the square and oval, chief of which is the protection it affords against opening up of surface seams. This characteristic tends to minimize the amount of billet surface preparation necessary prior to rolling.

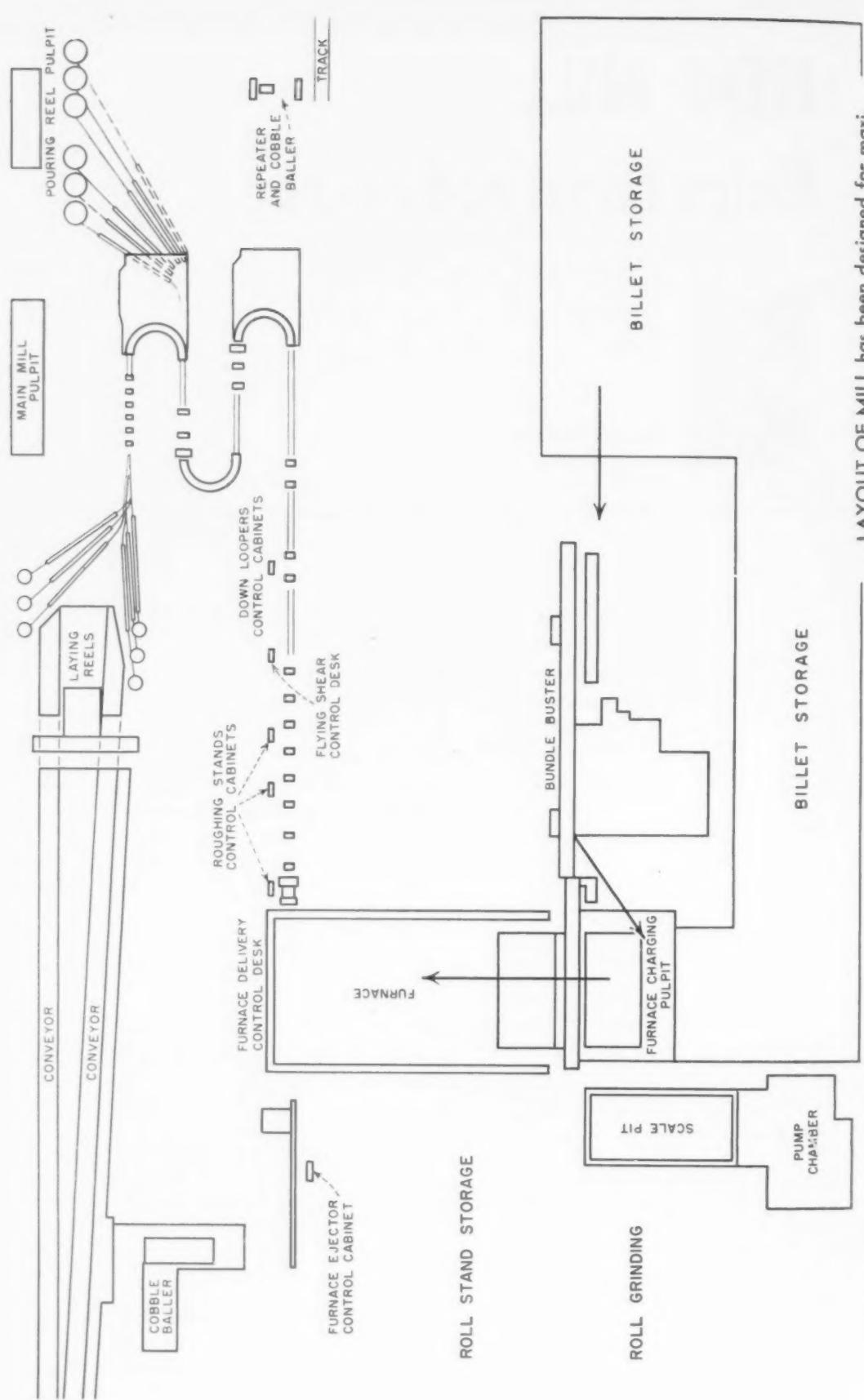
In the diamond and square, roll pressure is distributed evenly toward the center of the steel being rolled; the steel is supported on all sides, nullifying any tendency that might be present to open up seams. This is particularly

important in this stage of rolling. The square and oval has an opposite effect in the roughing phase, but once beyond this point its use is satisfactory.

The ease of roll changes becomes apparent in records showing that such changes consume only 8 to 10 pct of rolling time. In a specific instance, time consumed on 14 size changes—6 stands in, 6 stands out, involving 13 pass changes—was 8 pct of rolling time. Average for 2 stands out, 2 stands in has been 56 min.

This is due to the flexibility of adjustment of the stands. The housings are of unique design in that the complete housing is shifted laterally to bring the groove to be used in alignment with the desired pass lines. This is done by a hydraulic shifting mechanism.

If one groove becomes worn, the product



AYOUT OF MILL has been designed for maximum productive efficiency. For handling materials within the plant, liberal use of conveyors, automatic equipment has been made.

RR TRACK
RR TRACK

through the mill is held up long enough to shift that stand or perhaps more than one stand, at the same time, over to another set of grooves, sideways. The pass line is fixed vertically and fixed rest bars are used.

The roll assembly is brought up to the pass line by adjustment and either end of the bottom roll is brought level by raising or lowering one end. The top roll is held up on a hydraulic counterbalance and brought down to the proper pass opening through solid screws. When it is necessary to change rolls, the whole housing is freed by freeing of wedge bolts. The housing is picked up and another housing, previously assembled and adjusted, is lifted by crane into place and ready for pass adjustment sideways.

Top delivery speed 5000 fpm

Another feature is that once the steel leaves the roughing mill it passes through pairs of stands separated by free loops until it reaches the final six finishing stands. This gives a maximum degree of freedom from constraining forces which might affect the section rolled.

To get selectivity to fill the proper open pass in the mill, a unique selector lifts two billets (which are still in the mill) in such a way that the front end of the third billet, just entering the mill, is free to be guided into the proper groove.

The new mill rolls from 2½-in. square billets, 30 feet long or within a range of 25 to 30 feet. Top delivery speed is 5000 fpm, and finishing speeds range from 4400 to 5000 fpm. The mill was designed and built by United Engineering & Foundry Co. to produce 27,000 tons per month; actual top production has been approximately 25,000 tons per month. Average per hour is 35 tons for hours operated, including normal delays.

Furnace handles 60 tons per hour

As each lift of billets approaches the heating furnace, a "bundle buster" consisting of a series of parallel shafts with large rolls separates them and moves the individual billets to the furnace approach table via a walking beam. Built by Salem Engineering Co., the furnace is nominally of 60-ton per hr capacity.

The roughing mill consists of eight stands. First two sets of rolls are 16-in. diam., the remaining 15-in. Each pair of stands has a common drive. J. & L. believes this arrangement gives better control and flexibility, particularly should a change of billet size be desired. All six finishing stands are on a common drive.

After leaving the roughing mill, the steel passes through a flying shear before assuming a vertical loop, if necessary, before going into the first pair of intermediate stands. Pairs of stands after No. 12 and before the final 6 finishing stands are separated by 180° free horizontal loops. All passes from Nos. 9 to 16 are 12-in. diam. rolls.



OVERALL VIEW of new rod mill at Aliquippa plant of Jones & Laughlin Steel Corp.

Once through pass No. 16, the product can be taken off in the larger sizes from 0.359-in. diam. round to 0.656-in. The product is coiled in pouring reels. There are six pouring reels, two for each strand.

The smaller sizes are taken from No. 16 through another horizontal loop and repeated into the final six stands of the finishing mill. These stands are driven by a single motor through a common drive and delivered into six laying reels.

After leaving the finishing stands, coils are taken by drag conveyors to the transfer point where they are automatically switched to a hook conveyor and delivered to the wire mill cleaning building. After the cleaning operation they are automatically taken off the conveyor and transferred.

Quality of product has been excellent, both from the standpoint of roundness and gage. Most of J. & L.'s product is in carbon steel analyses, but within the ordinary range of rod and wire mill products including cold heading stock, and spring wire stock. A wide range of analyses is made in wire and steel mill materials.

Mill drive electrical equipment was furnished by General Electric Co. Roughing and finishing stands are equipped with antifriction bearings. Total area under roof is about 78,000 sq ft. The mill was started up Dec. 30, 1951.

COLD CHAMBER MACHINE Adds Flexibility, Economy

By C. H. Drewes

Superintendent
Die Casting Dept.
Harnischfeger Corp.
Milwaukee

♦ Aluminum, brass and zinc alloys are economically die-cast in a cold chamber machine recently set up at Harnischfeger Corp., Milwaukee . . . More than 75 parts in a wide range of sizes are needed to keep pace with the company's production of hoists, cranes and other products . . . An important advantage is the closer tie between casting availability and production needs.



FIG. 1—Zinc, brass and aluminum are handled in this Lester-Phoenix diecasting machine at

Harnischfeger Corp.'s Milwaukee plant. It makes 75 different parts.

• ECONOMY IN DIECASTING production and greater production flexibility have been achieved by Harnischfeger Corp., Milwaukee, through installation of a single cold chamber diecasting machine. Some 75 different diecastings in aluminum, brass and zinc alloys are produced on the machine.

Diecastings made on this machine are used in the company's varied line of hoists, cranes and other products. With one machine, with one operator and a helper, the company can take advantage of the high economy of diecasting without depending on several outside sources for supply of castings.

Today, nearly all aluminum and brass diecastings used by industry generally are produced in cold chamber machines. With zinc, the hot chamber or gooseneck and plunger machine is commonly used because it is faster and does excellent work.

Although a gooseneck setup could be applied to the Lester-Phoenix machine, Figs. 1 and 2, used by Harnischfeger, this would involve slow and expensive changeover from and back to aluminum and brass. Thus, in this installation it is more economical to use the cold chamber for zinc alloy as well as for aluminum and brass. For each base metal, however, the injection pressure applied is adjusted as needed. Pressure is lowest for zinc, highest for brass and intermediate for aluminum alloys. Locking pressure exerted by toggles of special design is ample even for highest injection pressure.

The metal temperature best suited for each alloy is used. These are easily attained by set-



FIG. 2—Ladling metal into the cold chamber of the casting machine from the adjacent furnace, which is adjusted to hold the metal at optimum temperature. Button that starts injection is pressed immediately after the ladle is emptied.

ting furnace control thermostats to hold the molten metal at desired temperature. All charges are ladled in by hand, and immediately injected into the die by advancing the injection ram.

Zinc alloy is chosen for many of the diecastings because it costs least per casting, is easiest to cast and yields longest die life, since casting is done at lowest temperature. Shrinkage is lowest for the zinc alloy and permits smaller cores with a minimum of breakage and better production.

Aluminum alloy is chosen chiefly for castings

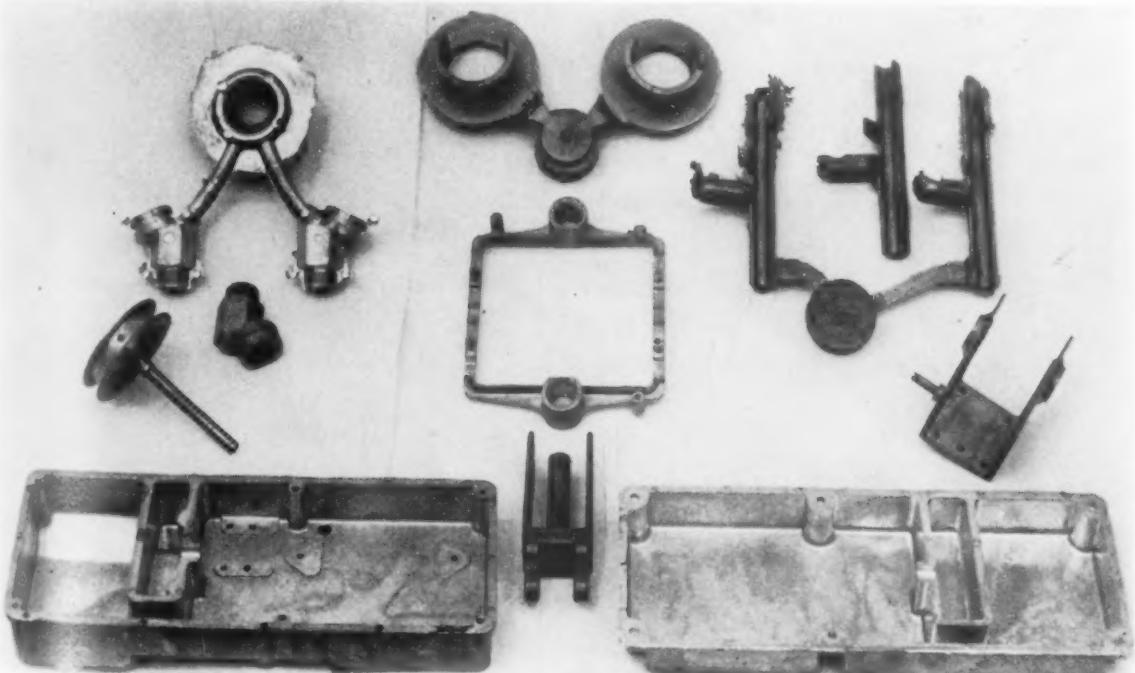


FIG. 3—Typical diecastings produced in zinc, brass and aluminum for Harnischfeger products.

Largest castings are zinc alloy, others are brass and aluminum, cover wide range of sizes.

that must be light in weight and where this alloy meets other requirements. Brass is selected where maximum strength or hardness, good bearing properties or wear resistance, fairly high electrical conductivity or some combination of these are controlling requirements. Brass casts readily but at rather high temperatures that tend to check die surfaces and shorten die life.

Diecasting lowers part cost

In Fig. 3, the two largest castings and the two smaller ones closest to and above them (both of which have steel inserts) are of zinc alloy. All four are used in electric hoists of 2000 lb or lower capacity. They require little or no machining, serve well in electrical controls and for enclosing same, and are economical to manufacture.

Flanged parts at top of Fig. 3 and those to the right of them are brass diecastings. Brass is chosen for the flanged parts because they serve as thrust bearings in crawler rollers where both good bearing properties and high strength are needed. Brass parts at top right, Fig. 3, are current collectors that ride along wires furnishing power to overhead cranes.

Many current collectors and current conductors are diecast from 40-60 brass because it is strong, more wear resistant and has sufficiently high electrical conductivity. Similar parts can be sand cast in nearly pure copper, which has higher electrical conductivity, but parts of the same shape cost about three times as much as

brass diecastings and have shorter service life because less wear resistant. Diecastings require less machine work than sand castings of the same shape and commonly have holes cored close to size.

In Fig. 4 are five brass diecastings. One of the brass parts is a connector of high strength and good electrical conductivity. Holes and the slot between clamping lugs are cored.

Smallest of the diecastings, Fig. 4, is in brass. Formerly, it was made in zinc alloy and subjected to considerable pressure in a clutch release application in which the metal proved too soft, hence the shift to brass, which is both stronger and harder, though costing more.

Zinc alloy is used for the elliptical casting in Fig. 4. This elliptical part is a pedal pad and on the rear face has two lugs for a cross pin that pivots the pad to a break lever. On the face are numerous short conical projections designed to keep the foot from slipping off. Formerly, a similar pad forged from steel and costing much more was used. Experience indicated the cones on the face of the forging wore smooth more quickly than those on the softer diecasting.

Operating cost is low

Moreover, the zinc diecasting is brighter, is more easily seen, and does not rust.

Production requirements keep the diecasting machine busy. It is run by an operator and helper, the machine costs little to operate and has proved its worth both from an economic standpoint and on general utility grounds.

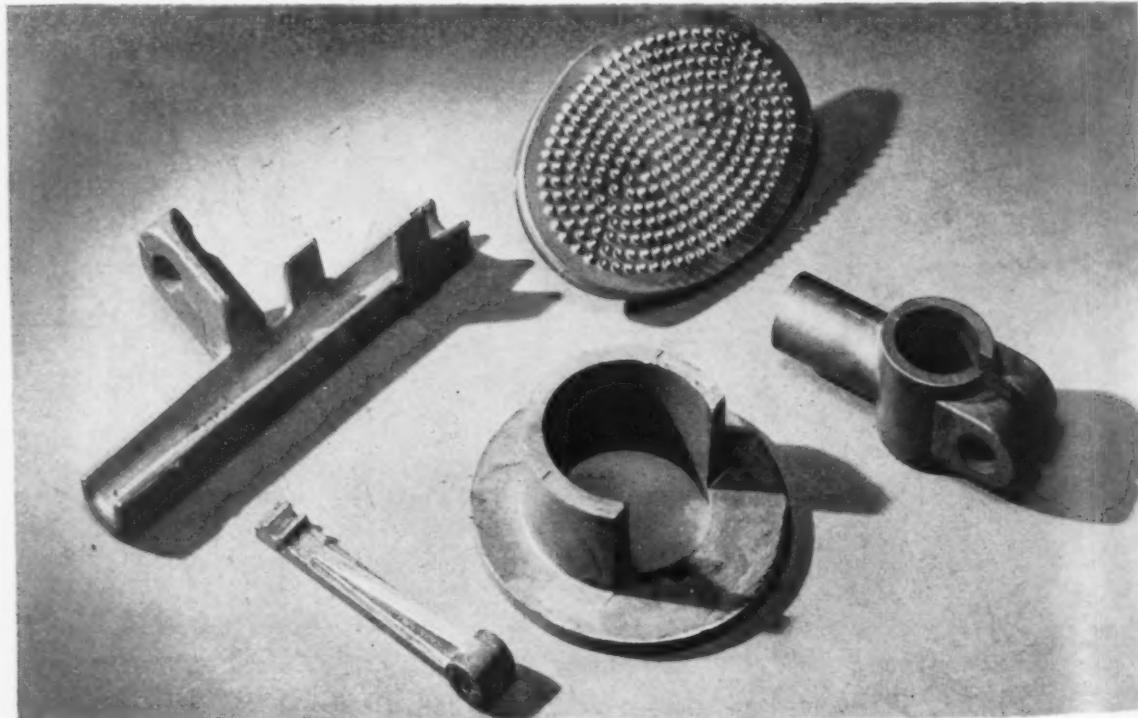


FIG. 4—All but one of these diecastings are made in brass, two being current carrying members, one a bearing and one a clutch lever. El-

liptically-shaped zinc alloy pedal pad, top, out-wears a steel forging previously used for this part. Now better grip is maintained.

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ALLEN® HEX KEYS: Size marked and made from special Allenoy steel for greater strength. Chamfered ends for quicker, easier insertion.



Technical Briefs

WELDING:

New equipment developed for gas-shielded process.

New welding equipment for the consumable-electrode gas-shielded welding process has been announced by the General Electric Co.'s Welding Dept.

The apparatus, Fillerarc, is expected to advance the application of high-speed, high-current-density, gas-shielded welding. Heretofore such welding has been hampered by the necessity of using existing welding generators not specifically designed for this process.

Operator Ups Output

High-speed metal deposition provided by the new equipment enables the operator to more than double output on applications where filler metal must be added, it is claimed. In addition, the equipment simplifies control, decreases operator training time, and reduces operating and maintenance costs, GE says.

Electrode wire of aluminum, stainless steel, mild steel, copper, magnesium, and other alloys may be used with argon or helium shielding gas.

The process can be used in down-hand, vertical, or over-head positions to weld aluminum of any alloy in thicknesses from 1/32 to 3 in. and stainless steel from 1/16 to 1 in. It is also suitable for welding aluminum-bronze, nickel, and magnesium.

Equipment consists of three main components: a special self-regulating motor-generator type welder, a



WELDING equipment consists of wire drive unit, welding gun and self-regulating welder.

IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 109. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

pistol-like holder, and an electronic wire-drive unit.

Constant Arc Length

Designed to give constant arc length, the new welder produces any current required up to its full rating. Thus, it is prepared for any wire feeding speed and will supply the current necessary to melt off the wire at exactly the rate it is fed. Machine settings are for arc length only and no current calibrations appear on the dial.

Once arc length is set, the operator can change wire feed while welding without the necessity of readjusting the welder.

The Fillerarc gun contains knurled feed rolls for pulling the electrode wire from a spool mounted in the wire drive unit, a trigger to control wire feed and gas flow, and an electrical contact tip. It is water cooled with a rating of 400 amp continuous dc. The gun is capable of feeding wire from 0.030 to 0.093 in. in diam.

Kinking No Hazard

The hazard of kinked electrode wire is eliminated inasmuch as the wire is "pulled" instead of "pushed" through the gun. Thus, smaller diameter wire can be used with the equipment, greatly increasing its range of application.

Third component of the new G-E equipment is the wire drive unit. Mounted on a portable carriage, the unit contains a Thy-motrol wire feed drive motor control which powers the knurled feed rolls in the welding gun through a flexible shaft.

JET TARGET:

Gun crews will train with remote controlled baby jet "planes."

Fleeting across the gun sights of ground crews will soon be a new high-speed, remote controlled aerial target. The sonic-speed targets are being built by Ryan Aeronautical Co. for Army Ordnance and will be used to train Army troops in the operation of the Skysweeper gun and the Nike and other guided missiles.

Pint Size Fighter

The new targets, which fly at almost the speed of sound, are remotely controlled from the ground and can maneuver, at varying speeds and altitudes, over anti-aircraft installations — simulating invading enemy aircraft. In this way, ground troops gain the experience of operating anti-aircraft guns and guided missiles under near-combat conditions.

Officially designated the XM21, the new air target looks like a "pint size" fighter plane. It has swept-back mid wings and tail surfaces and is approximately 12 ft wide and 18 ft long. It will weigh about 1800 lb. The design incorporates a two-stage parachute recovery system to lower each target without damage after a target run. It is powered by a Fairchild J-44 jet engine.

Rocket Helps Start

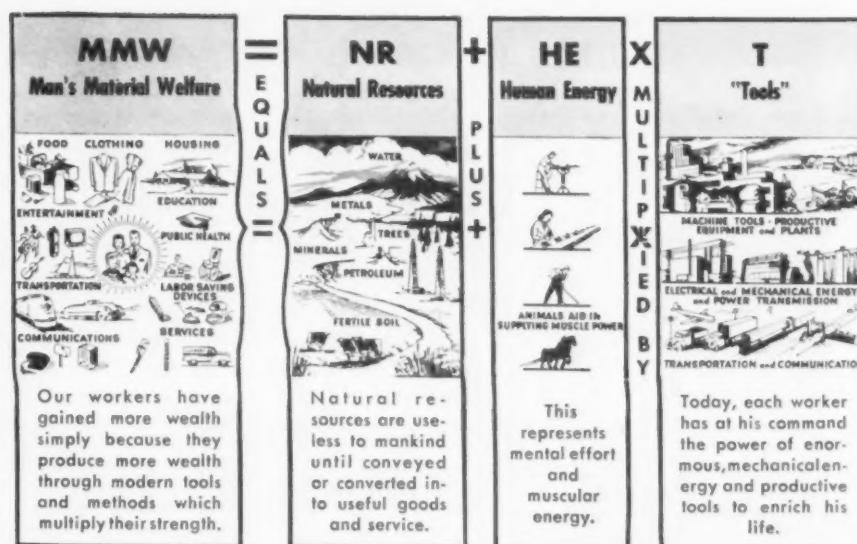
The target is ground launched from a platform with the aid of a rocket to catapult it to flying speed. A second or two after launching, the jet engine takes



PINT SIZED jet "plane" flying at sonic speeds will soon be used for training of ground gun crews.

Turn Page

August 27, 1953



Economics Unadulterated

Books on economics often complicate the subject by using confusing words and phrases which obscure the simple truths.

The DoALL Company, Des Plaines, Illinois, believes that more specific illustrations of some of the basic principles will contribute to a better understanding of the subject and its impact on our way of life. The need is to state simple facts of the mechanical operation of the several parts of the economic body in relation to the whole. This is the first of a series presenting these fundamentals.

The illustrated formula above presents the underlying principles. It shows how Americans have attained the highest living standards in the world because we have installed more and better tools than any other nation.

Men today aren't much stronger, can't work much faster than their grandfathers did. Today's torrential stream of goods and services for better, safer, longer living is the direct result of machine tools and telephones, power plants and trucks, engines and motors, gages and farm machines and all the other tools which multiply human energy. Because of increasing use of such tools, output per man hour in the United States tripled during the first half of this century.

Newest basic type of machine tool to multiply man's productivity is the Band Machine. Pioneered and introduced by The DoALL Company in 1935, machines and bands are now available to saw, grind, hone, polish, slice or file any known material. Their most unique feature is that in cutting straight lines or curves, they remove only a narrow slot of material.

Shell Oil Company's textbook "Machine Tools and Their Lubrication" says,



DoALL BAND MACHINES cut any shape, any material. Use of simple fixtures permits automatic, mass production like the slotting operation shown in the inset.

"Contour sawing enables the separation of the unwanted part of the metal by merely removing chips of metal contained in the narrow saw kerf or cut. In all other forms of machining all the unwanted metal must be removed in the form of chips. This fact, as a rule, enables the contour saw to produce the piece of the required shape in considerably shorter time than that required for other forms of machining, since the act of chip removal is the time-consuming part of any such operation".

The DoALL Company headquarters is in Des Plaines, Illinois. There are 38 DoALL Sales-Service Stores in the country, listed in local telephone directories.

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WRITE FOR WALL CHART "How Living Improves"—free of charge and without advertising matter.

Wheelabrator's fast thorough cleaning action scours metal surfaces brilliantly clean in but a few minutes — to save hours of cleaning time and cut costs to a minimum. That's the story at the B. H. Aircraft Company and everywhere else that Wheelabrator is used. Mr. Donald F. Baum, Vice-President, puts it this way:



Installation of the above Wheelabrator Tumblast saved 86% in cleaning time on pipe assemblies.

"We are currently using the Wheelabrator for cleaning of all details prior to the spot welding and/or silver brazing of these details on our pipe assemblies. These details are made from .032 low carbon and .065 nickel-chrom-moly steel and range up to 4" x 4" in size. The average time for cleaning is about 14% of the time for sand blasting. Sub assembly bodies are now Wheelabrated in 70% of the time formerly required."

See for yourself how this high speed blast cleaning can help you reduce your costs and improve the appearance of your products. Ask for a test demonstration without obligation. *Write today for details.*



American
WHEELABRATOR & EQUIPMENT CORP.
109 S. Bryn Mawr St., Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

Technical Briefs

over as the sole source of power and the rocket is jettisoned.

A development contract under the joint auspices of the Army, Navy and Air Force was placed with the Ryan Aeronautical Co., San Diego, Calif., prior to Korea. Early this year, Army Ordnance placed the first military production contract for the targets.

Delivery is expected later this year and will be shipped to Ordnance's White Sands Proving Ground in New Mexico, and Fort Bliss, Texas, where they will be put into operation. In addition, they will be used for studying the capabilities of high altitude targets in the high speed class.

Ryan engineers will supervise the technical and operational phases of the program at both Army installations.

BRAKE BEAMS:

Now unit offers 40 pct weight reduction

Strength and weight reductions are offered in new Boxweld unit and hangar-type freight brake beams of 18,000 and 24,000 lb capacities designed and manufactured by the A. O. Smith Corp.

Weight reductions up to 40 pct are accompanied by greater strength and load-carrying capacity with dead weight saving of approximately 160 lb per car.

Welded In One Piece

The all-steel brake beams are welded in one piece. Faces of brake heads and other wearing surfaces are made from wear resistant steel which is then hardened.

Compression and tension members are both channel sections welded at the ends to form a box section. The fulcrum also is an integrally-welded box section welded into the compression and tension members.

The fabricated steel brake heads are subsequently welded to the ends of the box section of the beam.

AAR certificates have been issued for the 24,000 lb capacity unit and ranger-type brake beams.

MACHINING:

3-D cam-cutters
work to ± 0.0002 in.

Production of three-dimensional cams by the Ford Instrument Co. requires as many as two thousand data points to be end-milled to set precisely the contours of hand-cut masters.

In one group of highly complicated computing mechanisms being built for the Air Force, accurate fabrication is essential. To be certain that all production cams duplicate their masters in every respect, Ford designed and built several pantograph-type cam-cutting machines, which can work to ± 0.0002 in. tolerance.

Cams Made of Meehanite

Each three-dimensional cam must be able continuously to sustain the live load introduced by a highly - pressurized stylus. To meet this requirement cams are made of Meehanite which provides good qualities of machinability, edge-strength, and wear. In addition, they are fabricated to ± 0.0005 in. tolerance, and hand-polished to produce a 20 micro-inch surface.

Once taken from their cast, the cams are heated to their sub-critical 1250° F temperature to give stress relief. Thermal stresses are subsequently minimized by furnace cooling. Then the ends are rough-sanded and milled, collars turned, and holes drilled.

Cams Are Rust-Proofed

Two shaping cuts are usually sufficient. The rough cut takes the metal down about 0.125 in., and the finish cut down about 0.010 in. These operations are followed by dimensional inspection, hand-polishing, and another dimensional inspection.

The cams are then rust-proofed by boiling in a ten pct solution of ammonium hydroxide followed by a baking-out process for two hours at 250° F. Surface finish is inspected, blemishes are removed by fine sanding, and final inspection takes place.

August 27, 1953



3

**SPECS FOR
NON-FERROUS
FINISHING
GOT YOU
DOWN?**

**FIND OUT
ABOUT
IRIDITE**

**TODAY for
finishing ZINC, CADMIUM, ALUMINUM, CUPROUS METALS**

WANT CORROSION RESISTANCE?

Iridite will give you better-than-specification protection against corrosion.

WANT PAINT ADHERENCE? Iridite provides a firm and lasting base for paint by preventing under-film corrosion.

WANT EYE-APPEAL? Iridite can give

you a variety of finishes, depending upon the metal being finished . . . from clear and sparkling bright or military olive drab, to attractive dyed colors.

BEST OF ALL, any Iridite finish is economical and easy to apply.

for example: **IRIDITE® (AL-COAT)** REDUCES NEED FOR ANODIZING

Simple chemical dip; immersion time only 10 seconds to 2 minutes; no sealing dip; color is clear or yellow depending upon your requirements; salt spray resistance equivalent to 20 to 30 minutes of anodizing, eliminates need for costly racks and electrical power.

WANT TO KNOW MORE? Write for literature and send production samples for free test processing. See "Plating Supplies" in your classified telephone directory or write direct.

Iridite is approved under government specifications.

ALLIED RESEARCH PRODUCTS
INCORPORATED

4004-06 E. MONUMENT STREET • BALTIMORE 3, MD



Manufacturers of Iridite Finishes
For Corrosion Protection and Paint Systems on Non-Ferrous Metals; ARP Plating Brightener.
West Coast Mfgs.: E. M. AUTOMOTIVE COMPANY

the switch is to **STAINLESS- CLAD PLATES**

**for lower costs...
extension of material supplies**

More and more, economy-minded buyers are switching to Stainless-Clad Steel Plates as an effective means of extending supplies of critical materials and of beating the high cost of stainless steel.

They find that in numerous types of fabrication these plates give them all the advantages of stainless steel, including high resistance to corrosion—yet with considerable savings in material costs.

Stainless-Clad Plates made by Claymont are a composite of stainless steel permanently bonded to carbon or alloy steel plate. They're easy to fabricate; will not buckle, crack or peel under the severest forming operations. Stainless cladding may be of any specified percentage of total plate from 10% to 50%.

Other Claymont products include Flanged and Dished Heads, Alloy and Carbon Steel Plates, Large Diameter Welded Steel Pipe.

To order, write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION—Denver, Colorado

PACIFIC COAST DIVISION—Oakland, California

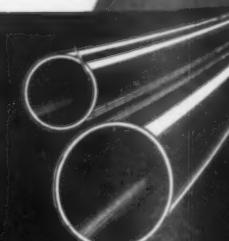
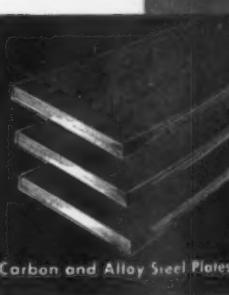
WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit

New Orleans • New York • Philadelphia

CANADIAN OFFICES: Toronto • Winnipeg • Edmonton • Vancouver

CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION



THE IRON AGE SUMMARY . . .

- Buying attitude changing steel market's outlook
- Desire to cut inventories seen as large factor
- GM fire but part of the reason for market decline

By springing steel loose for other customers, the General Motors transmission plant fire has stolen the headlines from the most influential development in the steel market today—the changing buying attitude of the metal user. No longer panicked by shortage into long-term forward buying, the metal consumer is altering procurement policies to fit the new temper of the times.

Uncertainties bred of the widespread feeling that the production boom is at crest and must ebb moderately is pushing the manufacturer into shorter-term buying based on competitive advantage.

Without question, the overall steel market will decline in the fourth quarter. Several large steel producers told THE IRON AGE that the main affliction of the market is a desire of consumers to reduce inventories. These users see the steel industry's expanded capacity as ironclad insurance against future shortages.

They are accordingly paring their fourth quarter orders. There is no incentive to push hard for most steel products, especially since prices will certainly stay static.

The Detroit steel market appears to be easing daily while steel men opine that the GM fire is but part of the reason. Steel companies with warehouses now concede that the urgency first was bled out of demand in late June. Contributing to the current easing are automotive parts suppliers who are starting to cancel steel orders.

Relatively unscathed by the transmission plant fire, Ford is the most aggressive steel buyer in Detroit, pressing for full fourth quarter steel coverage. Few other automotive firms care to buy past October and some refuse to place orders farther ahead than the end of September. Chrysler's buying interest has been considerably kindled since the fire menaces competitive GM divisions with production losses.

Demand along the steel products front is still ragged. Current weak sisters include tinplate, full alloy products, wire and wire products, and mechanical tubing. Hot-rolled

sheets continue in fair demand while strongest of all are cold-rolled sheets, carbon steel bars, seamless tubing, oil country goods, and plates.

Some steel products now in torrid demand will ease as months wear by. With fewer exceptions the overall relationship between demand and supply next year will be one of closer balance—a trait of a "normal" market.

When gaging demand for the rest of 1953, steelmakers see strength for cold-rolled sheets, bars, and seamless tubing. A decline in the operating rate to 90 pct of capacity does not mean a proportionate crash of steel industry profits. Unrelentingly high production results in strain on equipment, use of marginal facilities not fully economical in a normal market.

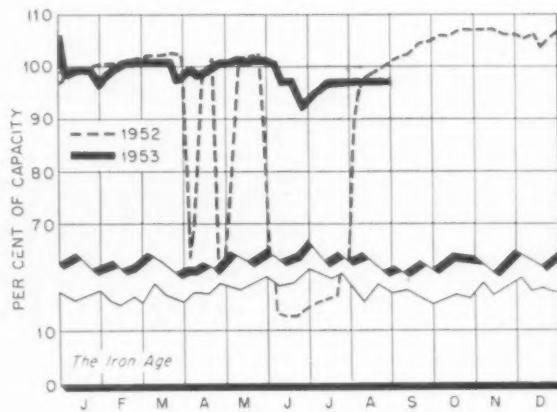
Marginal producers may feel a tearing strain in the intensified competitiveness of a normal market but for the bulk of the steel industry a normal market will not necessarily be a weak one.

Steel Operating Rates

	Week of Aug. 23	Week of Aug. 16	Week of Aug. 23	Week of Aug. 16
Pittsburgh	95.0	97.0*	Detroit	105.0
Chicago	97.0	102.0	Birmingham	94.0
Philadelphia	98.0	96.0*	Wheeling	97.0
Valley	99.0	100.0	S. Ohio River	75.5
West	99.5	99.0*	St. Louis	94.0
Cleveland	98.5	93.0*	East	93.0
Buffalo	106.5	106.5	AGGREGATE	95.5

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,522,470 net tons.

* Revised.



ENDURO Brightwork

HELPS KEEP COIN SLOTS BUSY



To sell—and keep on selling—beverage dispensers are placed in high traffic locations, often fully exposed to weather.

Still, they should sparkle quality—inspire confidence—to attract thirsty "prospects." Just as important, they must stand up under rough usage.

That's why Mundean Manufacturing Company, Columbus, Ohio, who made this beverage merchandiser, uses ENDURO Stainless Steel for tops and trim. Judging from nationwide performance reports, ENDURO brightwork will help keep the coin slots busy for years to come!

Tough ENDURO retains its distinctive luster—resists rust and corrosion—resists abrasions and dents—requires little maintenance. Its hard, smooth surface is easy to clean and keep clean, *always*. Naturally, there's no plating to wear or peel.

Chances are, ENDURO Stainless Steel can *scintillate* the eye-appeal and *buy-appeal* of your products . . . at the same time, increase their wearability—their life span. Why not talk over the possibilities with Republic metallurgists? There's no obligation, of course. Just write.

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N.Y.



Other Republic Products include Carbon and Alloy Steels—Pipe, Sheets, Strip, Plates, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

Markets at a Glance

Install New Locomotives—Class I railroads have installed 1409 new locomotives in the first 7 months of 1953, reports Assn. of American Railroads. Order backlogs as of Aug. 1 totaled 516 units against 570 on July 1. Of the total number put in service so far this year, 1397 were diesel-electric, 10 steam and 2 gas-turbine-electric. For the same period in 1952, Class I roads installed 1917 new locomotives, all diesel-electric except 9 steam, 2 electric and 5 gas-turbine-electric.

Furnace Shutdown . . . U. S. Steel Corp. shut down its No. 2 blast furnace at Youngstown Aug. 22 for partial repairs to furnace lining. Daily rated capacity is 1100 tons.

Buys Plastic Pipe Firm . . . Youngstown Sheet & Tube Co. has bought an interest in The Perrault Fibercast Corp., Tulsa, Okla., maker of glass fiber-reinforced thermosetting plastic pipe. Its product, known as "Fibrecast," will be distributed through Continental Supply Co., Youngstown Steel Products Co. and Youngstown Steel Products Co. of California.

Cut Cobalt . . . Lower prices for Cobalt-60 radiography sources have been set by Tracerlab, Inc., Boston. Prices now range from \$160.00 for a 10-millicurie source to \$600 for a 10-curi source. Former prices for comparable sources were \$195 to \$1115. Increased volume resulting in improvements and modifications in processing methods and equipment make the cuts possible, said John C. Pennock, industrial sales manager.

More Canadian Pig . . . Canadian pig iron production for May, 1953, topped all previous records at 271,461 net tons for a daily average of 94.6 pct of rated capacity and compares with 241,583 tons or 87 pct in the preceding month and with 237,079 tons or 92.2 pct of the capacity in May, 1952. For the month under review production included 227,022 tons of basic iron, 6487 tons of foundry iron and 37,950 tons of malleable iron. For the 5 months ended May 31, 1953, pig iron output totalled 1,221,404 net tons against 1,100,479 tons in the like period of 1952.

Steel Output Up . . . Canadian production of steel ingots and castings in May, 1953 amounted to 368,967 net tons or daily average of 93.9 pct of rated capacity compared with 362,291 tons or 95.3 pct for April and with 330,524 tons or 98.8 pct of rated capacity for May, 1952. For May 1953 production included 358,896 tons of

steel ingots and 10,071 tons of steel castings. For the 5 months ending with May 1953, production of steel ingots and castings totalled 1,770,943 net tons against 1,609,460 net tons in the 1952 period.

Tin Plate . . . Fourth quarter outlook for tin plate sales is even gloomier than had been expected. Some big customers have cut back as much as 70 pct on their orders. A leading producer believes fourth quarter shipments will be less than 50 pct of average for each of first three quarters.

Complete Program . . . Crucible Steel Co. of America has just about completed its \$100 million expansion and improvement program, begun in 1945, according to W. H. Colvin, president. Only about \$8.5 million remains to be spent on the overall program. Crucible expects to clear up borrowing used to finance the expansion by 1958. Of the money spent, approximately \$70 million went into projects in the Pittsburgh district, including the huge Midland, Pa., plant, coal mines, and Rem-Cru Titanium, Inc., a subsidiary company at Midland.

Farm Machinery Buying . . . Purchasing of pressure tubing by farm machinery companies is slackening, reports a steel producer in Pittsburgh. However the slack is being taken up by warehouses trying to restore inventories. Demand for oil country goods is seen as continuing strong for the rest of the year.

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Last Week	Month Ago	Year Ago
Composite Prices				
Finished Steel,				
base	4.634	4.634	4.634	4.376
Pig Iron (gross ton) . . .	\$56.76	\$56.76	\$56.76	\$55.26
Scrap, No. 1 hvy.				
(gross ton)	\$41.67	\$43.17	\$44.92	\$42.00
Nonferrous Metals				
Aluminum, ingot	21.50	21.50	21.50	20.00
Copper, electrolytic	29.50	29.25	29.88	24.50
Lead, St. Louis	13.80	13.80	13.55	15.80
Magnesium, ingot	27.00	27.00	27.00	24.50
Nickel, electrolytic	63.08	63.08	63.08	59.58
Tin, Straits, N. Y.	81.50	83.00	78.25	\$1.21
Zinc, E. St. Louis	11.00	11.00	11.00	14.00

Chileans Offer Copper to "Anyone"

Irrked by slow action in Washington the Chilean government would now sell to Russians if U. S. doesn't buy . . . Mobilizers meet this week on question—By R. L. Hatschek.

It's now reported that the Chilean government has offered to sell its copper stockpiles to anyone who will pay the price—including the Communist countries. Lack of action in Washington is said to have prompted this offer and the Foreign Minister is quoted as saying his government has decided to eliminate "restrictions imposed upon our foreign relations by previous governments."

Indications are that Russian copper supplies are short and Defense Mobilization Board is anxious to keep Chile's 85,000-ton copper stockpile from reaching the Reds.

Postponed Action . . . Decision on whether or not to buy 65,000 tons of the Chilean stocks was postponed. Further discussion on the proposal was rescheduled for this Wednesday and at presstime there was considerable pressure being brought to bear to have the U. S. buy at least a portion of the Chilean stocks at what is referred to as a "reasonable" price.

But the "reasonable" price is the subject of much dispute. The Chilean government has priced its copper at 35.50¢ at Chilean ports. Meanwhile the world price is hovering considerably below this figure at less than 30¢ per lb.

A Lever? . . . Chile wants to sell that copper, preferably at her own price. But as long as it sits it does the Chilean treasury no good. One possibility is that the Chileans are trying to get fast action in Washington by making this offer.

A later report stated that Chile would not accept European offers as long as negotiations continue with the U. S. This strengthens the feeling that the earlier move was made merely to speed up an agreement favorable to Chile.

And there's still the question of current production in the South American country. Feeling in copper trade circles is that the U. S. negotiators wanted to settle the price of metal now being produced before tackling the stockpiles.

Copper Scrap Up . . . Late last week custom smelter buying prices for copper scrap edged a bit higher following an advance of 1½¢ per lb in the custom smelter price for refined copper. No. 1 copper and wire is now pegged at 23¢ per lb, No. 2 at 21½¢ and light copper at 20¢.

Market Stays Quiet . . . In spite of all this the copper market remains quiet. There has been no rush of consumers to fill September requirements. Some feeling

has been expressed that the major producers' price of 30¢ per lb is too high and that buyers are waiting for a skid—but this isn't very likely.

The auto production cutback resulting from the fire at General Motors' transmission plant cuts automotive demand and copper producers also expect a decline in appliance manufacturing to further trim demand.

Ingot Output Dips . . . July production of brass and bronze ingots totaled 19,321 tons, the lowest monthly figure reported by the industry's Defense Council since July 1952. The dip resulted largely from holiday and vacation lulls. The total compares fairly well with the preceding month's figure of 20,818 tons but is way off from the year's high of 28,256 tons produced in March.

Aluminum Steady . . . Producers of aluminum are steadily chipping away at order backlogs but it seems a sure bet that most forms of the light metal will stay firm to tight at least through the end of the year. One thing the producers would like to see is something really definite on military requirements. To be sure, the situation is continually changing but the producers would like to know where they stand—and so would their customers.

Defense Mobilization Board is again mulling over the third round expansion which flopped pretty badly. A decision is expected sometime in the next 2 months. Olin Industries may yet get into the industry.

Zinc Stocks Rise . . . Zinc inventories are larger. Smelter statistics issued by American Zinc Institute show that July stocks increased 6600 tons to a total of 103,906 tons.

Meanwhile, smelter production at 80,025 tons, shows only a small decrease from the preceding month.

NONFERROUS METAL PRICES

(Cents per lb except as noted)

	Aug. 19	Aug. 20	Aug. 21	Aug. 22	Aug. 24	Aug. 25
Copper, electro, Conn. . . .	29.00— 30.00	29.00— 30.00	29.00— 30.00	29.00— 30.00	29.00— 30.00	29.00— 30.00
Copper, Lake, delivered	30.125	30.125	30.125	30.125	30.125	30.125
Tin, Straits, New York	82.75	82.75	81.25	81.50	81.50*	81.50*
Zinc, East St. Louis	11.00	11.00	11.00	11.00	11.00	11.00
Lead, St. Louis	13.80	13.80	13.80	13.80	13.80	13.80

Note: Quotations are going prices.

*Tentative



WORLD'S FASTEST In a trial run, "Slo-Mo-Shun IV" streaks over Lake Washington, Seattle, at better than 180 miles an hour.

What keeps her from flying to pieces?

Death crowds right into the cockpit beside you when you drive a boat like that.

Strange things happen. Every little wave jars the hull like a rutted road. Your foot burns at the touch of the jiggling accelerator. Your eyeballs jounce around in their sockets like glazed marbles as you keep watch for a sight you never hope to see:

Screw heads popping off like bullets as the beaten hull breaks up around you from the incessant pounding.

But that is one threat you no longer need to fear—not when your boat is held together with Anchorfast. Stan Sayres (he owns and drives the world's fastest boat) can tell you: Not even the varnish has cracked where her joints are nailed with Anchorfast.

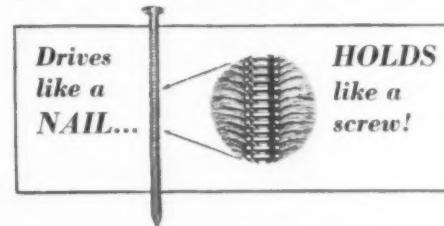
What is "Anchorfast?" Just about the most revolutionary fastener you ever did see (at right). Once you drive it in, it can split the handle of a claw hammer before it budges a thread.

Anyone could see what a wonderful idea it was when the manufacturer came to INCO with his question: "What metal?"

It had to be strong and tough for holding power, of course. And hard and stiff so you could drive it into hard wood without bending. Yet so rust-free and durable that it would outlast wood. Not too expensive either, mind you, for Anchorfast would sell in competition with ordinary brass screws.

Monel fulfilled every requirement as if it had been an INCO Nickel Alloy especially made for Anchorfast.

Then came INCO's Customer Co-



Inco Nickel Alloys



The holding power of Monel Anchorfast comes from its unique "biting tooth" design. The wedged wood fibers lock into the grooves like dozens of tiny vises. Like to try it yourself? Write for "Anchorfast Test Sample."

Monel® • "R"® Monel • "K"® Monel
 "KR"® Monel • "S"® Monel • Nickel
 Low Carbon Nickel • Duranickel®
 Inconel® • Inconel "X"® • Inconel "W"®
 Incoloy® • Nimonic® Alloys

Nonferrous Prices

(Effective Aug. 25, 1958)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Sheet: 0.136-in. and thicker, 2S, 3S, 33.9¢; 4S, 36.0¢; 52S, 38.4¢; 24S-O, 24S-OAL, 37.0¢; 75S-O, 75S-OAL, 44.7¢; 0.081-in., 2S, 3S, 35.1¢; 4S, 37.7¢; 52S, 39.9¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 46.9¢; 0.032-in., 2S, 3S, 37.0¢; 4S, 41.8¢; 24S-O, 24S-OAL, 46.9¢; 75S-O, 75S-OAL, 58.4¢.

Plate, 1/4-in. and Heavier: 2S-F, 3S-F, 32.4¢; 4S-F, 34.5¢; 52S-F, 36.2¢; 61S-O, 35.6¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 44.3¢.

Extruded Solid Shapes: Shape factors 1 to 5, 37.4¢ to 82.8¢; 12 to 14, 38.2¢ to 99.0¢; 24 to 26, 40.9¢ to \$1.29; 36 to 38, 48.4¢ to \$1.59.

Rod, Rolled: 1.064 to 4.5-in., 2S-F, 3S-F, 43.8¢ to 37.2¢; cold-finished, 0.375 to 3.499-in., 2S-F, 3S-F, 47.6¢ to 39.3¢.

Screw Machine Stock: Rounds, 11S-T3, 1/2 to 11/32-in., 59.6¢ to 47.0¢; 3/8 to 1 1/2-in., 46.6¢ to 43.8¢; 1 1/8 to 3-in., 42.7¢ to 39.9¢. Base 5000 lb.

Drawn Wire: Coiled 0.051 to 0.374-in., 2S, 44.1¢ to 32.4¢; 52S, 53.4¢ to 39.1¢; 17S-T4, 60.1¢ to 41.8¢; 61S-T4, 53.9¢ to 41.3¢.

Extruded Tubing: Rounds, 63S-T5, OD 1 1/4 to 2-in., 41.6¢ to 60.7¢; 2 to 4 in., 37.7¢ to 51.1¢; 4 to 6 in., 38.2¢ to 46.6¢; 6 to 9 in., 38.7¢ to 48.8¢.

Roofing Sheet: Flat, per sheet, 0.032-in., 42.5¢ x 60 in., \$2.838; x 96 in., \$4.543; x 120 in., \$5.680; x 144 in., \$6.816. Coiled sheet, per lb, 0.019 in. x 28 in.

Magnesium

(F.o.b. mill, freight allowed)

Sheet and Plate: FS1-O, 1/4 in., 66¢; 3/16 in., 68¢; 1/2 in., 70¢; B & S Gage 10, 71¢; 12, 75¢. Specifications grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam 1/4 to 0.311 in., 77¢; 1/2 to 3 in., 60.5¢; 1/4 to 1.749 in., 56¢; 2 1/2 to 5 in., 51.5¢. Other alloys higher. Base up to 3 in., diam, 10,000 lb; 1/4 to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 65.3¢; 0.22 to 0.25 lb, 5.9 in., 62.3¢; 0.50 to 0.59 lb, 8.6 in., 59.7¢; 1.8 to 2.59 lb, 19.5 in., 56.8¢; 4 to 6 lb, 28 in., 52¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 lb, 10,000 lb; 1/2 to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, 0.049 to 0.057 in. wall thickness: OD, 1/4 to 5/16 in., \$1.43; 5/16 to 3/8 in., \$1.29; 1/2 to 5 in., 96¢; 1 to 2 in., 79¢; 0.165 to 0.219 in. wall: OD, 5/8 to 3/4 in., 64¢; 1 to 2 in., 60¢; 3 to 4 in., 59¢. Other alloys higher. Base, OD: Up to 1 1/2 in., 10,000 lb; 1 1/2 to 8 in., 20,000 lb; over 8 in., 30,000 lb.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

"A" Nickel Monel Inconel

Sheet, CR	86 1/2	67 1/2	92 1/2
Strip, CR	92 1/2	70 1/2	98 1/2
Rod, bar	82 1/2	65 1/2	88 1/2
Angles, HR	82 1/2	65 1/2	88 1/2
Plate, HR	84 1/2	66 1/2	90 1/2
Seamless Tube	115 1/2	100 1/2	137 1/2
Shot, blocks	60	...	...

Copper, Brass, Bronze

(Freight included on 500 lb)

Extruded

	Sheet	Rods	Shapes
Copper	48.51	50.58	
Copper, h-r	50.48	46.83	...
Copper, drawn	48.08	...	...
Low brass	45.99	45.68	...
Yellow brass	42.87	42.56	...
Red brass	47.11	46.80	...
Naval brass	47.01	41.07	42.33
Leaded brass	48.76	48.45	39.95
Com. bronze	50.73	44.62	46.18
Mang. bronze	70.50	70.75	
Phos. bronze	44.91	40.47	41.72
Muntz metal	56.56	59.83	62.89

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	21.50
Aluminum pig	20.00
Antimony, American, Laredo, Tex.	34.50
Beryllium copper, per lb conta'd Be \$40.00 per lb contained Be	\$72.75
Bismuth, ton lots	\$2.25
Cadmium, del'd	\$2.00
Cobalt, 97-99% (per lb)	\$2.40 to \$2.47
Copper, electro, Conn. Valley	29.00 to 30.00
Copper, Lake, delivered	30.125
Copper, U.S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$165 to \$175
Lead, St. Louis	13.80
Lead, New York	14.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	27.00
Magnesium, sticks, 100 to 500 lb	45.00 to 47.00
Mercury, dollars per 76-lb. flask, f.o.b. New York	\$191 to \$194
Nickel electro, f.o.b. N. Y. warehouse	63.08
Nickel oxide sinter, at Copper Creek, Ont., contained nickel	56.25
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$93.00
Silver, New York, cents per oz.	85.25
Tin, New York	81.50
Titanium, sponge	\$5.00
Zinc, East St. Louis	11.00
Zinc, New York	11.25-11.83
Zirconium copper, 50 pct	\$6.20

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

Heavy	Turnings
Yellow brass	21 1/2
Red brass	25 1/2
Comm. bronze	26 1/2
Mang. bronze	20
Brass rod ends	19 1/2

Custom Smelters' Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	22
No. 2 copper wire	31 1/2
Light copper	28
*Refinery brass	18 1/2
* Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	23 - 21 1/2
No. 2 copper wire	20 1/2 - 21
Light copper	19 - 19 1/2
No. 1 composition	17 - 17 1/2
No. 1 comp. turnings	16 1/2 - 17
Rolled brass	13 - 13 1/2
Brass pipe	15 - 16
Radiators	12 1/2 - 13
	Aluminum
Mixed old cast	18 1/2 - 18 1/2
Mixed new clips	14 - 14 1/2
Mixed turnings, dry	13 - 13 1/2
Pots and pans	12 1/2 - 13 1/2

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	21
No. 2 heavy copper and wire	18 1/2 - 19
Light copper	16 1/2
New type shell cuttings	16 1/2
Auto radiators (unsweated)	11
No. 1 composition	15
No. 1 composition turnings	14 1/2
Unlined red car boxes	13
Cocks and faucets	13
Mixed heavy yellow brass	10
Old rolled brass	10
Brass pipe	14
New soft brass clippings	13 1/2
Brass rod ends	17 1/2
No. 1 brass rod turnings	13
	Aluminum
Alum. pistons and struts	6 1/2
Aluminum crankcases	9
2S aluminum clippings	9
Old sheet and utensils	5 1/2
Borings and turnings	9
Misc. cast aluminum	9
Dural clips (24S)	10

Zinc

New zinc clippings	5 1/2
Old zinc	4 1/2
Zinc routings	3 1/2
Old die cast scrap	3 1/2

Nickel and Monel

Pure nickel clippings	100
Clean nickel turnings	85
Nickel anodes	100
Nickel rod ends	100
New Monel clippings	25
Clean Monel turnings	30
Old sheet Monel	14
Nickel silver clippings, mixed	14
Nickel silver turnings, mixed	12

Lead

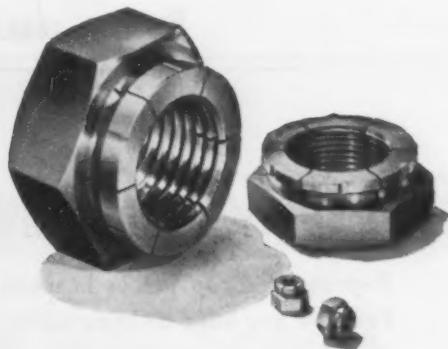
Soft scrap, lead	11 - 11 1/2
Battery plates (dry)	6 1/2 - 6 1/2
Batteries, acid free	4.60 - 4.70

Magnesium

Segregated solids	15 - 16
Castings	14 - 15

Miscellaneous

Block tin	65 - 67
No. 1 pewter	40 - 42
No. 1 auto babbitt	37 - 38
Mixed common babbitt	12 - 12 1/2
Solder joints	15 - 15 1/2
Siphon tops	15 1/2
Small foundry type	14 1/2
Monotype	13 1/2
Lino. and stereotype	11 1/2
Electrotype	9
Hand picked type shells	5 1/2
Lino. and stereo, dross	5
Zinc cyanide, 100 lb drum	47.7



How FLEXLOC locknuts reduce maintenance

FLEXLOCS reduce maintenance by staying where you put them. Once they are installed, you can forget them. Service and inspection periods can be stretched safely from days to weeks.

And FLEXLOCS eliminate complicated, time-consuming methods of locking threaded fasteners. They offer faster, simpler application, and safer, more dependable locking than plain nuts and lockwashers, castellated nuts and cotter pins, or nuts and jam nuts.

Use FLEXLOCS wherever you use an ordinary nut. These one piece, all metal locknuts—with nothing to assemble, come apart, lose or forget—won't work loose regardless of the vibration encountered. Yet they can be easily removed and used over and over again. FLEXLOCS are stop and lock nuts too. They don't have to seat to lock, and they stay put anywhere on a threaded member as soon as the locking threads are fully engaged.

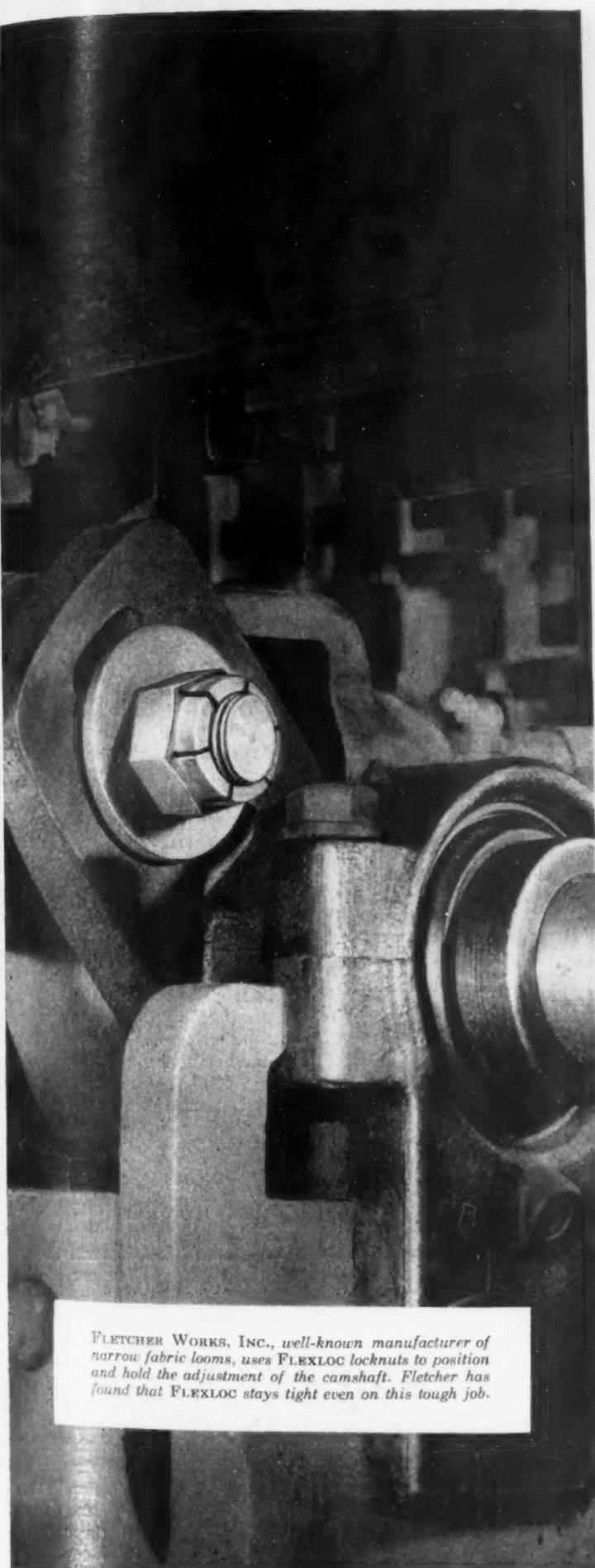
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FLETCHER WORKS, INC., well-known manufacturer of narrow fabric looms, uses FLEXLOC locknuts to position and hold the adjustment of the camshaft. Fletcher has found that FLEXLOC stays tight even on this tough job.

Scrap Silver Lining Hard to Find

Depressed scrap prices in most districts depress traders . . . Few see any hope of immediate recovery . . . IRON AGE Scrap Composite dips \$1.50 to \$41.67 . . . Fear further price dips.

Scrap men across the country were filled with woe this week as they watched prices tumble, feared further dips. THE IRON AGE Steel Scrap Composite, which had already fallen \$1.25 last week, tumbled another \$1.50 to \$41.67 per gross ton this week.

In the East, Philadelphia and New York were better off than several other areas across the country. Nothing much was moving, but prices for steelmaking grades were virtually unchanged. And there was hope of a major consumer coming into the New York market later in the week. But nobody expected him to be a philanthropist about prices.

Pittsburgh steelmaking grades were off \$1 to \$2 per ton, with little immediate prospect of an upswing. Ohio brokers were playing their cards close to their chests, but did not deny the possibility of a price skid.

Gloom was virtually unrelieved in Chicago, where shipments were going out of the area at sacrifice prices. Nobody saw any immediate halt to the downtrend. Detroit traders hoped that a drop in output of auto scrap of about 25 pct for the next month might firm up a weak market. But many felt this was whistling in the dark.

In Cleveland the market showed greater stability as there was no change in prices of steelmaking grades, though some sources expected further weakening in September. Scrap continued in the doldrums as in other areas.

Pittsburgh—On basis of a sale of No. 2 bundles, openhearth grades are off \$1 from last week. Apart from this, activity is largely restricted to filling of old orders. An independent mill bought a tonnage of No. 2 bun-

dles at \$1 and \$2 off the former price. Offering prices on both sides are said to be even lower this week. Low phos is down \$1 and No. 1 R.R. declined \$2 per ton on basis of a small sale. Some cast grades reflect generally weakening conditions. Blast furnace material is soft with prices unchanged.

Chicago—Scrap prices began slipping badly early last week and by midweek were in full downward flight. Electric furnace sales at \$41 were reported, and shipments were going out of the area at sacrifice prices. Early in the week one good sale had been expected at about \$2 under old prices. When this failed to materialize, asking prices began to plummet. A few rail grades were still holding their own. Broker buying has slowed.

Philadelphia—One broker described the market this week as "dragging its feet in the same rut as last week." Price levels are generally the same with a few quotations easing off. Dealers trimmed buying price over the weekend, say it's easier to get scrap than to sell it. Feeling is that openhearth scrap will weaken further.

New York—The market here is more or less marking time until a major consumer comes into the market again. Nobody can guess what the buying price will be, but general attitude is pessimistic. Low demand for steelmaking grades sets No. 1 heavy at \$35 flat. Turnings are slow, cast movement virtually dead. Prices are unchanged, but down sentiments prevail.

Detroit—Automotive scrap output is expected to be down as much as 25 pct for at least the next month because of slow production, model changeovers and the General Motors fire. Buyers wonder if this will revive the demand enough to counteract the bearish appearance of the market. Top grades continue to hold up, but turnings are weak enough to drop the market \$1 on appraisal.

Cleveland—Scrap market here this week was fairly stable with no change in prices for steelmaking grades. Limited buying was expected at press time. Informed sources believed there would be further weakening by September, but brokers who thought the market might bounce back were wary of quick sales. Dealers' scrap is still in the doldrums.

Birmingham—With pig iron plentiful and the largest buyer in the district, now out of the market, planning to buy in very limited quantities for some time, some scrap prices dropped sharply this week, while others declined moderately. On some items brokers have cut profit margins to 50¢, while on others there is a range up to \$1.50. There is no market here for a number of different steel items.

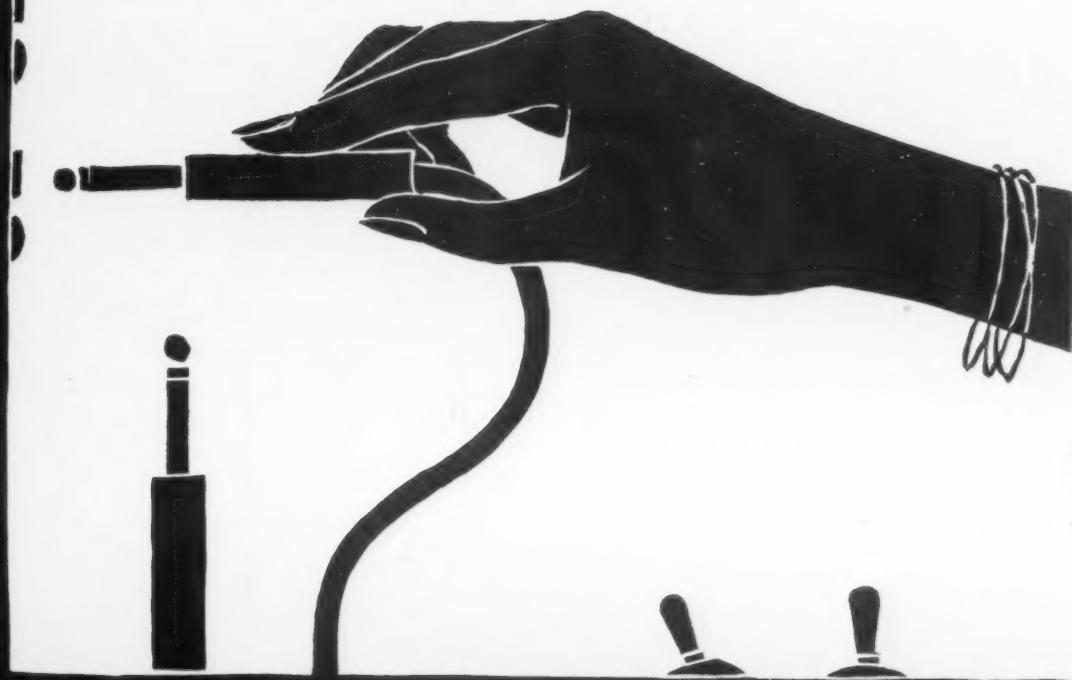
Cincinnati—There was no buying here this week and dealers and brokers both say the market is noticeably weaker. There is some doubt about the possibility of local mills coming in next month. If they do, many believe openhearth grades may tumble as much as \$5. Turnings, which have been nominal for weeks, dropped from \$1 to \$3 on appraisal.

Buffalo—Weakness in other markets was reflected here as entire market dropped \$2 a ton. No large sales of steelmaking grades were reported, but dealers agreed to lower prices as top mill refused to place new business at old prices and reports of declines came in from other areas. Dealers reported only a limited amount of new scrap being received.

Boston—The scrap trade reports that the market is exceptionally slow and that the price trend is down. Steelmaking grades and some turnings grades are off \$1 to \$2 per gross ton. Expectation is that prices might well go even lower this week.

West Coast—Only major activity last week was in Pacific Northwest. One mill there foresees a shortage and is continuing spirited buying at about 8000 tons per month with occasional upgrading. Los Angeles market continued sluggish. San Francisco somewhat weaker due to continued buying by one mill through 6-day openhearth walkout.

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BUYERS OF STAINLESS SCRAP, STRAIGHT CHROMES, NICHROME, PURE NICKEL, NICKEL ALLOYS & INCONEL

August 27, 1953

Scrap Prices

(Effective Aug. 25, 1953)

Pittsburgh

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 bundles	43.00 to 44.00
No. 2 bundles	37.00 to 38.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and ms. turns	26.00 to 27.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	30.00 to 31.00
Low phos. punch'gs, plate	46.00 to 47.00
Heavy turnings	39.00 to 40.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	53.00 to 54.00
RR. steel wheels	50.00 to 51.00
RR. spring steel	50.00 to 51.00
RR. couplers and knuckles	50.00 to 51.00
No. 1 machinery cast	49.00 to 50.00
Cupola cast	40.00 to 41.00
Heavy breakable cast	39.00 to 40.00
Malleable	47.00 to 48.00

Chicago

No. 1 hvy. melting	\$38.00 to \$40.00
No. 2 hvy. melting	33.00 to 35.00
No. 1 factory bundles	40.00 to 41.00
No. 1 dealers' bundles	38.00 to 41.00
No. 2 dealers' bundles	30.00 to 32.00
Machine shop turn.	18.00 to 20.00
Mixed bor. and turn.	21.00 to 23.00
Shoveling turnings	21.00 to 23.00
Cast iron borings	21.00 to 22.50
Low phos. forge crops	46.00 to 48.00
Low. phos. punch'gs, plate	42.00 to 43.00
Low phos. 3 ft and under	41.00 to 42.00
No. 1 RR. hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	46.00 to 48.00
Rerolling rails	56.00 to 58.00
Rails 2 ft and under	53.00 to 55.00
Locomotive tires, cut	45.00 to 47.00
Cut bolsters & slide frames	44.00 to 46.00
Angles and splice bars	46.00 to 48.00
RR. steel car axles	51.00 to 53.00
RR. couplers and knuckles	45.00 to 47.00
No. 1 machinery cast	42.00 to 44.00
Cupola cast	38.00 to 40.00
Heavy breakable cast	37.00 to 38.00
Cast iron brake shoes	37.00 to 39.00
Cast iron car wheels	42.00 to 44.00
Malleable	45.00 to 46.00
Stove plate	35.00 to 36.00

Philadelphia Area

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	36.50 to 38.00
No. 1 bundles	42.00 to 43.00
No. 2 bundles	33.00 to 34.50
Machine shop turn.	26.00 to 27.00
Mixer bor., short turn...	29.00 to 30.00
Shoveling turnings	31.00 to 32.00
Clean cast chem. borings	38.00 to 39.00
Low phos. 5 ft and under	44.00 to 45.00
Low phos. 2 ft and under	46.00 to 47.00
Low phos. punchings	46.00 to 47.00
Elec. furnace bundles	43.00 to 44.00
Heavy turnings	41.00 to 42.00
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	52.00 to 53.00
Cupola cast	37.00 to 38.00
Heavy breakable cast	41.00 to 42.00
Cast iron carwheels	45.00 to 46.00
Malleable	45.00 to 46.00
Unstripped motor blocks	30.00 to 32.00
No. 1 machinery cast	45.00 to 46.00
Charging box cast	37.00 to 38.00

Cleveland

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn...	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. 2 ft and under	46.00 to 47.00
Drop forge flashings	44.00 to 45.00
No. 1 RR. hvy. melting	47.00 to 48.00
Rails 3 ft and under	54.00 to 55.00
Rails 18 in. and under	56.00 to 57.00
Railroad grate bars	40.00 to 41.00
Steel axle turnings	38.00 to 39.00
Railroad cast	49.00 to 50.00
No. 1 machinery cast	50.00 to 51.00
Stove plate	44.00 to 45.00
Malleable	50.00 to 51.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	45.00 to 46.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	28.00 to 29.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. plate	48.00 to 49.00

Buffalo

No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	38.00 to 38.50
No. 1 bundles	41.00 to 42.00
No. 2 bundles	36.00 to 36.50
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	23.00 to 29.50
Shoveling turnings	30.00 to 30.50
Cast iron borings	29.00 to 29.50
Low phos. plate	43.00 to 44.00
Scrap rails, random lgth.	45.00 to 46.00
Rails 2 ft and under	51.00 to 52.00
RR. steel wheels	51.00 to 51.50
RR. spring steel	51.00 to 51.50
RR. couplers and knuckles	51.00 to 51.50
No. 1 machinery cast	42.00 to 43.00
No. 1 cupola cast	38.00 to 39.00

Detroit

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	30.00 to 31.00
New busheling	35.00 to 36.00
Drop forge flashings	35.00 to 36.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	19.00 to 20.00
Electric furnace, bundles	40.00 to 41.00
No. 1 cupola cast	43.00
Heavy breakable cast	33.00
Stove plate	35.00
Automotive cast	43.00

St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	19.00 to 21.00
Cast iron borings	19.00 to 21.00
No. 1 RR. hvy. melting	41.50 to 42.50
Rails, random lengths	43.50 to 44.50
Rails 18 in. and under	49.50 to 50.50
Locomotive tires, uncut	44.00 to 45.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	45.00 to 46.00
RR. spring steel	46.00 to 47.00
Cupola cast	40.00 to 41.00
Hvy. breakable cast	34.00 to 35.00
Cast iron brake shoes	40.00 to 41.00
Stove plate	34.00 to 35.00
Cast iron car wheels	43.00 to 44.00
Malleable	43.00 to 45.00
Unstripped motor blocks	34.00 to 35.00

New York

No. 1 hvy. melting	\$35.00
No. 2 hvy. melting	\$29.50 to 30.50
No. 2 bundles	28.00 to 29.00
Low phos. 2 ft and less	37.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
No. 1 machinery cast	41.00 to 42.00
Mixed yard cast	33.00
Charging box cast	34.00 to 35.00
Heavy breakable cast	34.00 to 35.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	\$28.00 to \$28.50
No. 2 hvy. melting	26.00 to 26.50
No. 1 bundles	23.00 to 23.50
No. 2 bundles	24.00 to 24.50
Machine shop turn.	15.00 to 16.50
Shoveling turnings	17.00 to 17.50
Cast iron borings	17.00 to 17.50
Electric furnace bundles	28.00 to 28.50
Bar crops and plate	34.00 to 34.50
Structural and plate, 2 ft	32.00 to 32.50
No. 1 RR. hvy. melting	30.00 to 30.50
Scrap rails, random lgth.	39.00 to 40.00
Rerolling rails	46.00 to 47.00
Rails, 18 in. and under	42.00 to 43.00
Angles & splice bars	42.00 to 43.00
Std. steel axles	43.00 to 44.00
No. 1 cupola cast	41.00 to 42.50
Stove plate	38.00 to 39.50
Cast iron car wheels	34.00 to 35.00
Charging box cast	29.00 to 30.00
Heavy breakable cast	25.00 to 26.00
Unstripped motor blocks	32.00 to 33.00
Mashed tin cans	17.00 to 18.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$30.00 to \$31.00
No. 2 hvy. melting	27.00 to 28.25
No. 1 bundles	30.00 to 31.00
No. 2 bundles	25.00 to 26.25
No. 1 busheling	30.00 to 31.00
Elec. furnace, 3 ft & under	32.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and short turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Clean cast chem. borings	27.17
No. 1 machinery cast	31.00 to 32.00
Mixed cupola cast	29.00 to 30.00
Heavy breakable cast	30.00 to 31.00
Stove plate	25.00 to 26.00
Unstripped motor blocks	22.00

Cincinnati

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$41.00 to \$42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. 18 in. & under	47.00 to 48.00
Rails, random lengths	45.00 to 46.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast	42.00 to 43.00
Heavy breakable cast	37.00 to 38.00
Drop broken cast	48.00 to 49.00

San Francisco

No. 1 hvy. melting	\$28.00
No. 2 hvy. melting	24.00
No. 1 bundles	25.00
No. 2 bundles	22.00
No. 3 bundles	18.00
Machine shop turn.	15.00
No. 1 RR. hvy. melting	28.00
No. 1 cupola cast	\$38.00 to 39.00

Los Angeles

No. 1 hvy. melting	\$24.00
No. 2 hvy. melting	20.00
No.	

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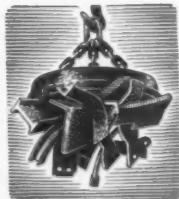
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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

(Effective Aug. 25, 1953)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 26 1953
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.925¢	3.925¢	3.925¢	3.775¢
Cold-rolled sheets	4.775	4.775	4.775	4.575
Galvanized sheets (10 ga.)	5.275	5.275	5.075	
Hot-rolled strip	3.925	3.925	3.925	3.725
Cold-rolled strip	5.575	5.575	5.20	
Plate	4.10	4.10	4.10	3.90
Pins wrought iron	9.00	9.00	9.00	9.00
Stain's C-R strip (No. 302)	41.50	41.50	41.50	36.75*

Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.95
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	
Special coated mfg. terne	7.75	7.75	7.75	7.75

Bars and Shapes: (per pound)				
Merchant bars	4.15¢	4.15¢	4.15¢	3.90¢
Cold finished bars	5.20	5.20	5.20	4.925
Alloy bars	4.875	4.875	4.875	4.675
Structural shapes	4.10	4.10	4.10	3.85
Stainless bars (No. 302)	35.50	35.50	35.50	31.50*
Wrought iron bars	10.05	10.05	10.05	10.05

Wire: (per pound)				
Bright wire	5.525¢	5.525¢	5.525¢	5.225¢

Rails: (per 100 lb.)				
Heavy rails	\$4.825	\$4.325	\$4.325	\$3.775
Light rails	5.20	5.20	5.20	4.25

Semi-finished Steel: (per net ton)				
Rerolling billets	\$62.00	\$62.00	\$62.00	\$59.00
Slab, rerolling	62.00	62.00	62.00	59.00
Forging billets	75.50	75.50	75.50	70.50
Alloy blooms, billets, slabs	82.00	82.00	82.00	76.00

Wire Rod and Skelp: (per pound)				
Wire rods	4.525¢	4.525¢	4.525¢	4.325¢
Skelp	3.75	3.75	3.75	3.55

Finished Steel Composite: (per pound)				
Base price	4.634¢	4.634¢	4.634¢	4.376¢

* Add 4.7 pct.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem B3	58.00	58.50	59.00	59.50	
Birmingham R3	52.38	52.88			
Birmingham W9	52.38	52.88			
Birmingham S5	52.38	52.88			
Buffalo R3	56.00	56.50	57.00		
Buffalo H1	56.00	56.50	57.00		
Buffalo W6	56.00	56.50	57.00		
Chicago I4	56.00	56.50	56.50	57.00	
Cleveland A5	56.00	56.50	56.50	57.00	61.00
Cleveland R3	56.00	56.50	56.50	57.00	
Daingerfield L3	52.50	52.50	52.50		
Duluth I4	56.00	56.50	56.50	57.00	
Erie I4	56.00	56.50	56.50		
Everett M6	63.25	63.75	57.00		
Fontana K1	62.00	62.50			
Geneva, Utah C7	56.00	56.50	56.50	57.00	61.00
Granite City G2	57.90	58.40	58.90		
Hubbard Y1			56.50		
Minnequa C6	58.00	59.00	59.00		
Monesen P6	56.00				
Neville Isl. P4	56.00	56.50	56.50		
Pittsburgh U1	56.00			57.00	
Sharpsville S3	56.00	56.50	56.50	57.00	
Stedton B3	58.00	58.50	59.00	59.50	64.00
Swedeland A2	60.00	60.50	61.00	61.50	
Toledo I4	56.00	56.50	56.50	57.00	
Troy, N. Y. R3	58.00	58.50	59.00	59.50	64.00
Youngstown Y1			56.50	57.00	
N. Tonawanda T1			56.50	57.00	

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phosphorus, 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 and over.

Silvery Iron: Buffalo, H1, \$68.25; Jackson, J1, G1, \$67.00. Add \$1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add \$1 per ton for 0.75 pct or more phosphorus. Manganese as above. Bessemer ferrasilicon prices are \$1 over comparable silvery iron.

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$62.19	\$62.19	\$62.19	\$60.60
Foundry, Valley	56.50	56.50	56.50	55.00
Foundry, Southern, Cin'ti	60.43	60.43	60.43	58.90
Foundry, Birmingham	52.88	52.88	52.88	51.40
Foundry, Chicago†	56.50	56.50	56.50	55.40
Basic, Valley furnace	61.27	61.27	61.27	59.77
Malleable, Chicago†	56.50	56.50	56.50	54.50
Malleable, Valley	56.50	56.50	56.50	53.00
Ferromanganese, cents per lb.	10.00¢	10.00¢	10.00¢	8.00¢

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡ Average of U. S. Prices quoted on Ferroalloy pages, 76 per lb. base

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Pig Iron Composite: (per gross ton)				
Pig iron	\$56.76	\$56.76	\$56.76	\$55.26

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$43.50	\$44.50	\$44.50	\$43.50
No. 1 steel, Phila. area	42.50	42.50	42.50	41.50
No. 1 steel, Chicago	39.00	42.50	44.00	41.50
No. 1 bundles, Detroit	40.50	40.50	40.50	40.50
Low phosph., Youngstown	48.50	48.50	48.50	48.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	52.00
No. 1 mach'y cast, Philadel'ia	45.50	45.50	45.50	52.00
No. 1 mach'y cast, Chicago	43.00	45.00	46.50	45.00

* Basing pt., less broker's fee. † Shipping pt., less broker's fee.

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$41.67	\$43.17	\$44.92	\$42.00

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$14.75	\$14.75	\$14.75	\$14.75
Foundry coke, prompt	17.25	17.25	17.25	17.25

	Aug. 25 1953	Aug. 18 1953	July 28 1953	Aug. 25 1953
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.50†	29.25†	29.25†	24.50
Copper, Lake, Conn.	30.125	30.125	30.125	24.25
Tin, Straits, New York	81.50†	83.00	78.25	81.25
Zinc, East St. Louis	11.00	11.00	11.00	14.00
Lead, St. Louis	13.80	13.80	13.55	15.50
Aluminum, virgin ingot	21.50	21.50	21.50	20.00
Nickel, electrolytic	63.08	63.08	63.08	59.58
Magnesium, ingot	27.00	27.00	27.00	24.50
Antimony, Laredo, Tex.	34.50	34.50	34.50	34.50

* Tentative. † Average. * Revised.

STAINLESS STEELS

Base price cents per lb., f.a.b.

Product	301	302	303	304	316	321	347	410	416	431
Ingots, rerolling	16.25	17.25	18.75	18.25	28.00	22.75	24.50	14.00		14.25

How to Fabricate More Profits



From 50% rejects to 1%



10c saved per piece



15% to 20% savings



40% rejects before—now 1%



8c to 10c saved per piece



From 20% rejects to none

This is a story of small change that put folding money in the pockets of a half-dozen fabricators of metal products.

The small change is that of specifying Carpenter Stainless Tubing rather than just "stainless tubing" . . . the folding money is attested by the captions under the pictures at the left.

What is more important to you, however, is the fact that none of the orders were for "specials" . . . all of these pieces were made from "mill run" tubing as delivered by Carpenter.

The moral of the story is, of course, that there is a difference in Stainless Tubing—and Carpenter makes it. Why not make the most of this *provable* difference in your own shop—for your own profit. Call your nearest Carpenter Distributor for your next order of tubing . . . plus design and engineering help if you need it. "One Call Does It All."

The Carpenter Steel Company, Alloy Tube Division, Union, N.J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.

"CARSTEELCO"

Carpenter

STAINLESS TUBING & PIPE



• guaranteed on every shipment



IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.																	
STEEL PRICES		INGOTS			BILLETS, BLOOMS, SLABS			PIPE SKELP		PIL-ING		SHAPES STRUCTURALS		STRIP					
		Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy		Hot-rolled		Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy			
EAST	Bethlehem, Pa.						\$82.00 B3			4.15 B3	6.20 B3								
	Buffalo, N. Y.				\$62.00 B3	\$75.50 B3, R3			4.925 B3	4.15 B3	6.20 B3	3.925 B3, R3	5.45 B3	6.00 B3	6.05 B3				
	Claymont, Del.																		
	Coatesville, Pa.																		
	Conshohocken, Pa.											4.325 A2		6.20 A2					
	Harrisburg, Pa.																		
	Hartford, Conn.																		
	Johnstown, Pa.				\$62.00 B3	\$75.50 B3	\$82.00 B3			4.15 B3	6.20 B3								
	Morrisville, Pa.																		
	New Haven, Conn.												5.95 A5	6.20 D1					
	Phoenixville, Pa.									4.95 P2									
	Sparrows Pt., Md.											3.925 B3	5.45 B3	6.00 B3	6.05 B3				
	Worcester, Mass.																		
MIDDLE WEST	Trenton, N. J.																		
	Alton, Ill.											4.20 L1							
	Ashland, Ky.											3.925 A7							
	Canton-Maxillon, Dover, Ohio						\$75.50 R3	\$82.00 R3											
	Chicago, Ill.						\$62.00 U1	\$75.50 R3, U1, W8	\$82.00 U1, W8, R3	4.925 U1	4.10 U1, W8	6.175 U1, Y1	3.925 A1, W8	5.95 A1	5.95 R3				
	Sterling, Ill.																		
	Cleveland, Ohio												5.45 A5, J3	7.80 J1	8.15 A5				
	Detroit, Mich.						\$63.00 R5		\$78.50 R5	\$85.00 R5				4.225 G3	5.65 G3, M2	6.50 G3	7.90 D1	8.50 G2	
	Duluth, Minn.																		
	Gary, Ind. Harbor, Indiana						\$62.00 U1	\$75.50 U1	\$82.00 U1, Y1	4.925 I3	4.10 I3, U1	6.175 U1, I3	3.925 I3, U1, Y1	5.70 I3	5.85 U1, I3	6.45 Y1			
	Granite City, Ill.																		
	Kokomo, Ind.																		
	Mansfield, Ohio													5.95 E2					
WEST	Middletown, Ohio													5.45 A7					
	Niles, Ohio													4.225 S1	5.80 S1	5.95 S1	7.65 S1		
	Sharon, Pa.																		
	Pittsburgh, Pa.						\$59.00 U1	\$62.00 U1	\$62.00 U1, \$62.50 J3	\$75.50 J3, U1	\$82.00 U1	3.75 U1, 3.85 J3	4.925 U1	4.10 J3, U1	6.175 J3, U1	4.425 S7, S9	5.45 B4, J3	6.15 S7	7.80 J1
	Midland, Pa.																		
	Portsmouth, Ohio																		
	Weirton, Wheeling, Follansbee, W. Va.													4.53 W3	4.825 W3	5.45 F3, W3	6.30 W3	6.30 H3	
	Youngstown, Ohio																		
	Fontana, Cal.																		
	Geneva, Utah													4.75 K1	6.825 K1	4.70 K1	7.35 K1	7.95 K1	
	Kansas City, Mo.													4.10 C7	6.175 C7				
	Los Angeles, Torrance, Cal.													4.80 S2	6.875 S2	4.625 S2		6.65 S2	
	Minnequa, Colo.													4.55 C6		4.025 C6			
SOUTH	San Francisco, Niles, Pittsburg, Cal.													4.75 B2	6.80 B2	4.675 B2, C7			
	Seattle, Wash.													4.85 B2	6.90 B2				
	Atlanta, Ga.															4.475 A8			
Fairfield, Ala.																			
Alabama City, Ala.																			
Houston, Texas																			

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

IRON AGE

STEEL PRICES

(Effective Aug. 25, 1953)

SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE
Hot-rolled 18 ga. & heavier	Cold- rolled	Galvanized 10 ga.	Enameling 12 ga.	Long Tenne 10 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.	Cokes* 1.25-lb. base box	Electro* 1.25-lb. base box	Holloware Enameling 29 ga.
1.925 B3	4.775 B3				5.90 B3	7.225 B3			4.525 W6		
6.125 A2					6.15 A2						
6.025 U1	4.875 U1										
1.925 B3	4.775 B3	5.275 B3			5.90 B3	7.225 B3	8.075 B3		4.625 B3	\$8.80 B3	\$7.50 B3
									4.825 A5		
1.925 A7		5.275 A7	5.175 A7						4.70 L1		
		5.275 R3	5.675 R1					5.825 R1			
1.925 A1, W1					5.90 U1				4.525 A5, N4.R3		
1.925 J3, R3	4.775 J3, R3		5.175 R3		5.90 J3, R3	7.225 J3, R3			4.625 N4		
6.125 G3	4.975 G3				6.375 G3	7.675 G3			4.525 A5		
1.925 B3, U1,Y1	4.775 B3, U1,Y1	5.275 U1, 5.325 J3	5.175 J3, U1	5.675 U1	5.90 U1,I3 6.40 Y1	7.225 U1 7.725 Y1				\$8.70 J3, U1,Y1	\$7.40 J3, U1
6.30 G2	5.27 G2	5.475 G2	5.875 G2							\$7.60 G2	6.30 G2
		5.375 C9									
			6.25 E2				5.80 E2				
	4.775 A7		5.175 A7	5.675 A7							
4.225 S1 5.425 N3	5.80 N3		6.775 N3	5.45 S1 6.00 N3	5.90 S1					\$7.40 R3	
7.50 J1	4.775 J3, U1,P6	5.275 U1	5.175 U1		5.90 J3, U1	7.225 J3, U1	7.925 U1		4.525 A5 4.725 P6	\$8.70 J3, U1	\$7.40 J3, U1
								4.725 P7			
3.925 W3, W5	4.775 W3, W5	5.275 W3, W5		5.675 W3, W5	6.175 W3	7.475 W3				\$8.70 W3, W5	\$7.40 W3, W5
7.60 R1 8.30 Y1	4.775 R3, U1,Y1	5.175 Y1			5.90 U1,R3 6.40 Y1	7.225 R3 7.725 Y1			4.525 Y1	\$8.70 R3	
4.70 K1	5.875 K1				7.00 K1	8.275 K1			5.325 K1		
6.025 C7								4.775 C6	4.865 S2		
6.025 C7		6.025 C7						5.325 B2			
6.025 C7	5.725 C7	6.025 C7						4.775 C6			
								5.175 C7	\$9.45 C7	\$8.15 C7	
3.925 R3, T2	4.775 T2	5.275 R3, T2			5.90 T2			5.125 T2 5.225 R3	4.525 T2, R3	\$8.80 T2	\$7.50 T2
6.425 S2									4.925 S2		

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extra apply.										
STEEL PRICES		BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Wire Bright
EAST	Bethlehem, Pa.				4.875 B3	6.325 B3	6.225 B3					
	Buffalo, N. Y.	4.15 B3, R3	4.15 B3, R3	5.25 B5	4.875 B3, R3	6.325 B3 6.325 B5	6.225 B3	4.10 B3			6.25 B3	5.525 W6
	Claymont, Del.								4.55 C4		5.65 C4	
	Coatesville, Pa.								4.35 L4		5.75 L4	
	Conshohocken, Pa.								4.55 A2	5.15 A2		6.50 A2
	Harrisburg, Pa.								6.50 C3			
	Hartford, Conn.				5.75 R3		6.775 R3					
	Johnstown, Pa.	4.15 B3	4.15 B3			4.875 B3		6.225 B3	4.10 B3		5.55 B3	6.25 B3 5.525 B3
	Newark, N. J.				5.65 W10		6.65 W10					
	New Haven, Conn.					5.65 P10		6.50 P10				
	Camden, N. J.					5.75 W10						
	Putnam, Conn.											
	Sparrows Pt., Md.		4.15 B3						4.10 B3		5.55 B3	6.25 B3 5.625 B3
	Palmer, Worcester, Mansfield, Mass.				5.75 B5 6.10 W11		6.775 B5					5.825 A1 W6
	Readville, Mass.				5.75 C14							
MIDDLE WEST	Alton, Ill.											
	Ashland, Ky.								4.10 A7			
	Canton-Massillon, Ohio	4.15 R3			5.20 R2, R3	4.875 R3	6.325 R2, R3					
	Chicago, Ill.	4.15 R3, U1, N4, W8	4.15 R3, N4 4.90 N4		5.20 A5, W10, W8, B5, L2	4.875 U1, W8, R3	6.325 A5, W8, W10, L2, R3, B5		4.10 U1, W8	5.15 U1	5.55 U1	6.25 U1 5.525 A5, R3, N4 5.625 W7
	Cleveland, Ohio	4.15 R3	4.15 R3		5.20 A5, C13		6.325 A5, C13		4.10 J3, R3	5.15 J3		6.25 J3 5.525 A5, R3, C13
	Detroit, Mich.	4.30 R5 4.50 G3			5.35 R5, P8 5.40 B5 5.45 P3	5.025 R5 5.225 G3	6.475 R5, P8 6.525 B5, P3	6.875 G3	4.65 G3			7.10 G3
	Duluth, Minn.											5.525 A5
	Gary, Ind. Harbor, Crawfordsville, Indiana	4.15 I3, U1, Y1	4.15 I3, U1, Y1		5.20 R3	4.875 I3, U1, Y1	6.325 R3, M5	6.225 U1, I3 6.725 Y1	4.10 I3, U1, Y1	5.15 I3	5.55 U1	6.25 U1, I3 6.75 Y1 5.625 M4
	Granite City, Ill.								4.60 G2			
	Kokomo, Ind.											5.625 C9
	Sterling, Ill.	4.25 N4	4.25 N4									5.625 N4
	Niles, Ohio Sharon, Pa.								4.10 S1		5.70 S1	6.25 S1
	Pittsburgh, Pa. Midland, Pa.	4.15 J3, U1	4.15 J3, U1	5.20 A5, J3, W10, R5, C8	4.875 U1, C11	6.325 A5, W10, C8	6.225 J3, U1	4.10 J3, U1	5.15 U1	5.55 U1	6.25 J3, U1	5.525 A5, J3, P6
	Portsmouth, Ohio											5.725 P7
WEST	Weirton, Wheeling, Follansbee, W. Va.	4.30 W3							4.40 W3			
	Youngstown, Ohio	4.15 R3, U1, Y1	4.15 R3, U1, Y1	5.20 Y1, F2	4.875 U1, Y1, C10	6.325 Y1, C10, F2	6.225 U1 6.725 Y1	4.10 R3, U1, Y1				6.75 Y1 5.525 Y1
	Emeryville, Cal.	4.9055	4.9055									
	Fontana, Cal.	4.85 K1	4.85 K1			5.925 K1		7.475 K1	4.75 K1		6.60 K1	6.95 K1
	Geneva, Utah								4.10 C7			6.25 C7
	Kansas City, Mo.	4.85 S2	4.85 S2			5.575 S2		6.925 S2				6.125 S2
	Los Angeles, Torrance, Cal.	4.85 B2, C7	4.85 B2, C7	6.65 R3	5.925 B2		6.925 B2					6.475 B2
	Minnequa, Colo.	4.60 C6	4.75 C6						4.95 C6			5.775 C6
	Portland, Ore.	4.90 O2										
	San Francisco, Niles, Pittsburgh, Cal.	4.85 C7, P9 4.90 B2	4.85 C7, P9 4.90 B2					6.975 B2				6.475 C7
SOUTH	Seattle, Wash.	4.90 B2, N6	4.90 B2, S11					6.975 B2	5.00 B2			7.15 B2
	Atlanta, Ga.	4.45 A8	4.45 A8									5.775 A8
	Fairfield, Ala. Alabama City, Ala.	4.15 R3, T2	4.15 R3, T2					6.225 T2	4.10 R3, T2			6.25 T2 5.525 R3, T2
	Houston, Texas Ft. Worth, Texas	4.65 S2	4.65 S2			5.375 S2			4.60 S2			5.925 S2

Steel Prices

(Effective Aug. 25, 1953)

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
 A2 Alan Wood Steel Co., Conshohocken, Pa.
 A3 Allegheny Ludlum Steel Corp., Pittsburgh
 A4 American Cladmetals Co., Carnegie, Pa.
 A5 American Steel & Wire Div., Cleveland
 A6 Angel Nail & Chaplet Co., Cleveland
 A7 Armc Steel Corp., Middletown, O.
 A8 Atlantic Steel Co., Atlanta, Ga.
 B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
 B2 Bethlehem Pacific Coast Steel Corp., San Francisco
 B3 Bethlehem Steel Co., Bethlehem, Pa.
 B4 Blair Strip Steel Co., New Castle, Pa.
 B5 Bliss & Laughlin, Inc., Harvey, Ill.
 C1 Calstrip Steel Corp., Los Angeles
 C2 Carpenter Steel Co., Reading, Pa.
 C3 Central Iron & Steel Co., Harrisburg, Pa.
 C4 Claymont Products Dept., Claymont, Del.
 C5 Cold Metal Products Co., Youngstown
 C6 Colorado Fuel & Iron Corp., Denver
 C7 Columbia Geneva Steel Div., San Francisco
 C8 Columbia Steel & Shafting Co., Pittsburgh
 C9 Continental Steel Corp., Kokomo, Ind.
 C10 Copperweld Steel Co., Glassport, Pa.
 C11 Crucible Steel Co. of America, New York
 C12 Cumberland Steel Co., Cumberland, Md.
 C13 Cuyahoga Steel & Wire Co., Cleveland
 C14 Compressed Steel Shafting Co., Readville, Mass.
 D1 Detroit Steel Corp., Detroit
 D2 Detroit Tube & Steel Div., Detroit
 D3 Driver Harris Co., Harrison, N. J.
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.
 E1 Eastern Stainless Steel Corp., Baltimore
 E2 Empire Steel Co., Mansfield, O.
 F1 Firth Sterling, Inc., McKeesport, Pa.
 F2 Fitzsimmons Steel Corp., Youngstown
 F3 Follansbee Steel Corp., Follansbee, W. Va.
 G1 Globe Iron Co., Jackson, O.
 G2 Granite City Steel Co., Granite City, Ill.

G3 Great Lakes Steel Corp., Detroit
 H1 Hanna Furnace Corp., Detroit
 J2 Ingersoll Steel Div., Chicago
 I3 Inland Steel Co., Chicago
 J4 Interlake Iron Corp., Cleveland
 J1 Jackson Iron & Steel Co., Jackson, O.
 J2 Jessop Steel Corp., Washington, Pa.
 J3 Jones & Laughlin Steel Corp., Pittsburgh
 J4 Joslyn Mfg. & Supply Co., Chicago
 J5 Judson Steel Corp., Emeryville, Calif.
 K1 Kaiser Steel Corp., Fontana, Cal.
 K2 Keystone Steel & Wire Co., Peoria
 K3 Koppers Co., Granite City, Ill.
 L1 Laclede Steel Co., St. Louis
 L2 La Salle Steel Co., Chicago
 L3 Lone Star Steel Co., Dallas
 L4 Lukens Steel Co., Coatesville, Pa.
 M1 Mahoning Valley Steel Co., Niles, O.
 M2 McLouth Steel Corp., Detroit
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.
 M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
 M5 Monarch Steel Co., Inc., Hammond, Ind.
 M6 Mystic Iron Works, Everett, Mass.
 N1 National Supply Co., Pittsburgh
 N2 National Tube Co., Pittsburgh
 N3 Niles Rolling Mill Div., Niles, O.
 N4 Northwestern Steel & Wire Co., Sterling, Ill.
 N5 Newport Steel Corp., Newport, Ky.
 N6 Northwest Steel Rolling Mill, Seattle
 O1 Oliver Iron & Steel Co., Pittsburgh
 O2 Oregon Steel Mills, Portland
 P1 Page Steel & Wire Div., Monessen, Pa.
 P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh
 P6 Pittsburgh Steel Co., Pittsburgh
 P7 Portsmouth Div., Detroit Steel Corp., Detroit
 P8 Plymouth Steel Co., Detroit
 P9 Pacific States Steel Co., Niles, Cal.
 P10 Precision Drawn Steel Co., Camden, N. J.
 R1 Reeves Steel & Mfg. Co., Dover, O.
 R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
 R3 Republic Steel Corp., Cleveland
 R4 Roebling Sons Co., John A., Trenton, N. J.
 R5 Rotary Electric Steel Co., Detroit
 S1 Sharon Steel Corp., Sharon, Pa.
 S2 Sheffield Steel Corp., Kansas City
 S3 Shenango Furnace Co., Pittsburgh
 S4 Simonds Saw & Steel Co., Fitchburg, Mass.
 S5 Sloss Sheffield Steel & Iron Co., Birmingham
 S6 Standard Forging Corp., Chicago
 S7 Stanley Works, New Britain, Conn.
 S8 Superior Drawn Steel Co., Monaca, Pa.
 S9 Superior Steel Corp., Carnegie, Pa.
 S10 Sweet's Steel Co., Williamsport, Pa.
 S11 Seidelhuber Steel Rolling Mills, Seattle
 T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
 T2 Tennessee Coal & Iron Div., Fairfield
 T3 Tennessee Products & Chem. Corp., Nashville
 T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
 T6 Tremont Nail Co., Wacham, Mass.
 T7 Texas Steel Co., Fort Worth
 U1 United States Steel Co., Pittsburgh
 U2 Universal-Cyclopa Steel Corp., Bridgeville, Pa.
 W1 Wallingford Steel Co., Wallingford, Conn.
 W2 Washington Steel Corp., Washington, Pa.
 W3 Weirton Steel Co., Weirton, W. Va.
 W4 Wheatland Tube Co., Wheatland, Pa.
 W5 Wheeling Steel Corp., Wheeling, W. Va.
 W6 Wickwire Spencer Steel Div., Buffalo
 W7 Wilson Steel & Wire Co., Chicago
 W8 Wisconsin Steel Co., S. Chicago, Ill.
 W9 Woodward Iron Co., Woodward, Ala.
 W10 Wyckoff Steel Co., Pittsburgh
 W11 Worcester Pressed Steel Co., Worcester, Mass.
 Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (per cent) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD												SEAMLESS										
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.		
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	
STANDARD T. & C.																							
Sparrows Pt. B3	24.25	8.0	27.25	12.0	29.75	15.5	32.25	16.5	32.75	17.5	33.25	18.0	34.75	18.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Youngstown R3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Fontana K1	13.25	+2.0	16.25	1.0	18.75	4.5	21.25	5.5	21.75	6.5	22.25	7.0	23.75	7.0	23.75	7.0	23.75	7.0	23.75	7.0	23.75	7.0	
Pittsburgh J3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Alton, Ill. L1																							
Sharon M3	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Pittsburgh N1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Wheeling W5	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Wheatland W4	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Youngstown Y1	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Indiana Harbor Y1	25.25	9.0	28.25	13.0	30.75	16.5	33.25	17.5	33.75	18.5	34.25	19.0	35.75	19.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Lorain N2	26.25	10.0	29.25	14.0	31.75	17.5	34.25	18.5	34.75	19.5	35.25	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
EXTRA STRONG PLAIN ENDS																							
Sparrows Pt. B3	27.75	13.0	31.75	17.0	33.75	20.5	34.25	19.5	34.75	20.5	35.25	21.0	35.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	36.75	20.0	
Youngstown R3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Fontana K1	16.75		20.75		22.75		23.25		23.75		24.25		24.75		25.25		25.75		26.25		26.75		
Pittsburgh J3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Alton, Ill. L1																							
Sharon M3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Pittsburgh N1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Wheeling W5	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Wheatland W4	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Youngstown Y1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Indiana Harbor Y1	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	
Lorain N2	28.75	14.0	32.75	18.0	34.75	21.5	35.25	20.5	35.75	21.5	36.25	22.0	36.75	21.0	37.25	20.0	37.75	20.0	38.25	19.5	38.75	19.0	
Sharon M3	29.75	15.0	33.75	19.0	35.75	22.5	36.25	21.5	36.75	22.5	37.25	23.0	37.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	38.75	22.0	

Galvanized discounts based on zinc, at 11¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: 1/2 in., 3/4 in., and 1 in., 1 pt.; 1 1/4 in., 1 1/2 in., 2 in., 2 1/2 in., 3 in., and 4 in., 2 1/2 pts.; 5 in., 6 in., and 8 in., 3 1/2 pts.; 10 in., 12 in., and 14 in., 4 1/2 pts.; 16 in., 18 in., and 20 in., 5 1/2 pts.; 22 in., 24 in., and 26 in., 6 1/2 pts.; 28 in., 30 in., and 32 in., 7 1/2 pts.; 34 in., 36 in., and 38 in., 8 1/2 pts.; 40 in., 42 in., and 44 in., 9 1/2 pts.; 48 in., 50 in., and 52 in., 10 1/2 pts.; 56 in., 58 in., and 60 in., 11 1/2 pts.; 64 in., 66 in., and 68 in., 12 1/2 pts.; 72 in., 74 in., and 76 in., 13 1/2 pts.; 80 in., 82 in., and 84 in., 14 1/2 pts.; 88 in., 90 in., and 92 in., 15 1/2 pts.; 96 in., 98 in., and 100 in., 16 1/2 pts.; 104 in., 106 in., and 108 in., 17 1/2 pts.; 112 in., 114 in., and 116 in., 18 1/2 pts.; 120 in., 122 in., and 124 in., 19 1/2 pts.; 128 in., 130 in., and 132 in., 20 1/2 pts.; 136 in., 138 in., and 140 in., 21 1/2 pts.; 144 in., 146 in., and 148 in., 22 1/2 pts.; 152 in., 154 in., and 156 in., 23 1/2 pts.; 160 in., 162 in., and 164 in., 24 1/2 pts.; 168 in., 170 in., and 172 in., 25 1/2 pts.; 176 in., 178 in., and 180 in., 26 1/2 pts.; 184 in., 186 in., and 188 in., 27 1/2 pts.; 192 in., 194 in., and 196 in., 28 1/2 pts.; 200 in., 202 in., and 204 in., 29 1/2 pts.; 208 in., 210 in., and 212 in., 30 1/2 pts.; 216 in., 218 in., and 220 in., 31 1/2 pts.; 224 in., 226 in., and 228 in., 32 1/2 pts.; 232 in., 234 in., and 236 in., 33 1/2 pts.; 240 in., 242 in., and 244 in., 34 1/2 pts.; 248 in., 250 in., and 252 in., 35 1/2 pts.; 256 in., 258 in., and 260 in., 36 1/2 pts.; 264 in., 266 in., and 268 in., 37 1/2 pts.; 272 in., 274 in., and 276 in., 38 1/2 pts.; 280 in., 282 in., and 284 in., 39 1/2 pts.; 288 in., 290 in., and 292 in., 40 1/2 pts.; 296 in., 298 in., and 300 in., 41 1/2 pts.; 304 in., 306 in., and 308 in., 42 1/2 pts.; 312 in., 314 in., and 316 in., 43 1/2 pts.; 320 in., 322 in., and 324 in., 44 1/2 pts.; 328 in., 330 in., and 332 in., 45 1/2 pts.; 336 in., 338 in., and 340 in., 46 1/2 pts.; 344 in., 346 in., and 348 in., 47 1/2 pts.; 352 in., 354 in., and 356 in., 48 1/2 pts.; 360 in., 362 in., and 364 in., 49 1/2 pts.; 368 in., 370 in., and 372 in., 50 1/2 pts.; 376 in., 378 in., and 380 in., 51 1/2 pts.; 384 in., 386 in., and 388 in., 52 1/2 pts.; 392 in., 394 in., and 396 in., 53 1/2 pts.; 400 in., 402 in., and 404 in., 54 1/2 pts.; 408 in., 410 in., and 412 in., 55 1/2 pts.; 416 in., 418 in., and 420 in., 56 1/2 pts.; 424 in., 426 in., and 428 in., 57 1/2 pts.; 432 in., 434 in., and 436 in., 58 1/2 pts.; 440 in., 442 in., and 444 in., 59 1/2 pts.; 448 in., 450 in., and 452 in., 60 1/2 pts.; 456 in., 458 in., and 460 in., 61 1/2 pts.; 464 in., 466 in., and 468 in., 62 1/2 pts.; 472 in., 474 in., and 476 in., 63 1/2 pts.; 480 in., 482 in., and 484 in., 64 1/2 pts.; 488 in., 490 in., and 492 in., 65 1/2 pts.; 496 in., 498 in., and 500 in., 66 1/2 pts.; 504 in., 506 in., and 508 in., 67 1/2 pts.; 512 in., 514 in., and 516 in., 68 1/2 pts.; 520 in., 522 in., and 524 in., 69 1/2 pts.; 528 in., 530 in., and 532 in., 70 1/2 pts.; 536 in., 538 in., and 540 in., 71 1/2 pts.; 544 in., 546 in., and 548 in., 72 1/2 pts.; 552 in., 554 in., and 556 in., 73 1/2 pts.; 560 in., 562 in., and 564 in., 74 1/2 pts.; 568 in., 570 in., and 572 in., 75 1/2 pts.; 576 in., 578 in., and 580 in., 76 1/2 pts.; 584 in., 586 in., and 588 in., 77 1/2 pts.; 592 in., 594 in., and 596 in., 78 1/2 pts.; 600 in., 602 in., and 604 in., 79 1/2 pts.; 608 in., 610 in., and 612 in., 80 1/2 pts.; 616 in., 618 in., and 620 in., 81 1/2 pts.; 624 in., 626 in., and 628 in., 82 1/2 pts.; 632 in., 634 in., and 636 in., 83 1/2 pts.; 640 in., 642 in., and 644 in., 84 1/2 pts.; 648 in., 650 in., and 652 in., 85 1/2 pts.; 656 in., 658 in., and 660 in., 86 1/2 pts.; 664 in., 666 in., and 668 in., 87

Steel Prices

(Effective Aug. 25, 1958)

CLAD STEEL

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. L4	32.7	
Washington, Pa. J2		
Claymont, Del. C4		
New Castle, Ind. I2	32.50	
Nickel-carbon		
10 pct. Coatesville, Pa. L4	37.5	
Inconel-carbon		
10 pct. Coatesville, Pa. L4	46.10	
Monel-carbon		
10 pct. Coatesville, Pa. L4	38.90	
Aluminized steel sheets, hot dip, Butler, Pa. A7		

* Includes annealing and pickling, sandblasting.

ELECTRICAL SHEETS

F.o.b. Mill Cents Per Lb.	22 Ga. H-R cut length	Armature	Elec.			
			Motor		Dynamo	
			Elec.	Motor	Dynamo	Transi. 72
Beech Bottom W5	8.35	9.60	10.40	10.95	11.50	12.20
Brackenridge G3	8.35	9.80	10.40	10.95	11.50	12.20
Granite City G2	8.35	9.80	10.40	10.95	11.50	12.20
Ind. Harbor I3	7.85	8.35	9.60	10.40	10.95	11.50
Manfords E2	7.85	8.35	9.60	10.40	10.95	11.50
Newport, Ky. N5	7.85	8.35	9.60	10.40	10.95	11.50
Niles, O. N3	7.85	8.35	9.60	10.40	10.95	11.50
Vandergrift U1	7.85	8.35	9.60	10.40	10.95	11.50
Warren, O. R3	7.85	8.35	9.60	10.40	10.95	11.50
Zanesville A7	7.85	8.35	9.60	10.40	10.95	11.50

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails					
	Col	Col	Col	Col	Col	Col
Alabama City R3	131	140	149	153	6.675	7.075
Aliquippa, Pa. J3	131	143	149	153	6.675	7.20
Atlanta A8	134	146	152	159	6.925	7.475
Bartonsville K2	131	143	149	156		
Buffalo W6						
Chicago, Ill. N4	131	143	149	156	6.675	7.225
Cleveland A6	137					
Cleveland A5						
Crawfordsville M4	133	145	151	153	6.675	7.325
Donora, Pa. A5	131	140	149	153	6.675	7.07
Duluth A8	131	140	145	149	6.675	7.075
Fairfield, Ala. T2	131	140	149	153	6.675	7.075
Galveston D4	139	148				
Houston S2	139	151				
Johnstown, Pa. B3	131	143	145	156	6.675	7.225
Joliet, Ill. A5	131	140	149	153	6.675	7.475
Kokomo, Ind. C9	133	142	151	155	6.775	7.175
Los Angeles B2						
Kansas City S2	143	155	161	168	7.275	7.825
Minneapolis C6	136	145	154	162	6.925	7.325
Monessen P6	131	145			6.675	7.225
Moline, Ill. R3						
Pittsburgh, Cal. C7	150	163	173	173	7.625	8.025
Portsmouth P7	132					
Rankin, Pa. A5	131	140			6.675	7.075
So. Chicago R3	131	140	145	149	6.675	7.075
S. San Fran. C6						
Sparrows Pt. B3	133		151	158	6.775	7.325
Struthers, O. Y1						
Worcester A5	137					
Williamsport, Pa. S10	133		158			

Cut Nails, carloads, base \$8.00 per keg (less 20¢ to jobbers), at Conshohocken, Pa. A2.

* Alabama City and So. Chicago don't include zinc extra. Galvanized products computed with zinc at 11.8¢ per lb.

CAST IRON WATER PIPE

Per Net Ton							
6 to 24-in., del'd Chicago	\$110.30	to \$113.80					
6 to 24-in., del'd N.Y.	113.50	to 114.50					
6 to 24-in., Birmingham	96.50	to 101.00					
6-in. and larger f.o.b. cars, San Francisco, Los Angeles, for all rail shipments: rail and water shipments less	\$128.00	to \$130.00					
Class "A" and gas pipe, \$5 extra: 4-in. pipe is \$5 a ton above 6-in.							

WAREHOUSES

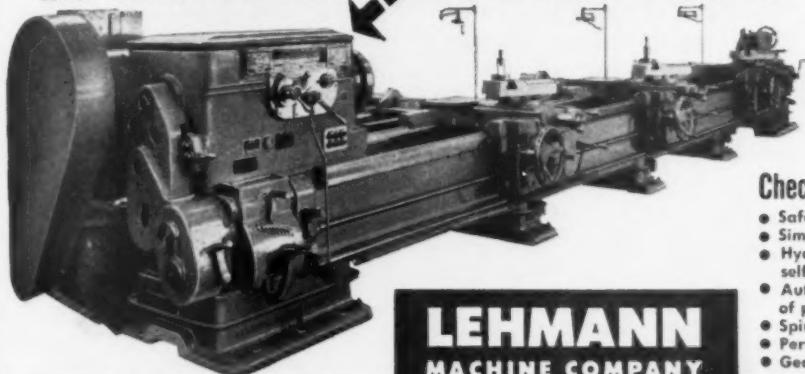
City	Delivery Charge	Sheets		Strip		Plates		Shapes		Bars		Alloy Bars			
		Hot-Rolled	Cold-Rolled (15 gauge)	Hot-Rolled	Cold-Rolled	Standard	Structural	Hot-Rolled	Cold-Finished	Hot-Rolled	A615 As rolled	Hot-Rolled	A610 As rolled	Cold-Drawn A615 As rolled	Cold-Drawn A610 As annealed
Baltimore	\$20	6.20	7.64	7.81 ³	7.00	6.85	6.98	6.86	8.17						
Birmingham	15	6.10	7.00	8.00 ⁴	6.30	6.35	6.35	6.15	8.75						
Boston	20	6.89	7.83	9.23	7.13	9.23-	9.35 ²	7.13	7.06	6.87	8.35	12.40	12.25-	12.28	14.78
Buffalo	20	6.18	7.15	9.00	6.65	6.65-	6.65	6.35-	7.70			12.17-	14.45	14.45	14.55
Chicago	20	6.20	6.20	6.79	6.42	6.33-	6.46	6.28	7.30			11.75			14.25
Cincinnati	20	6.46	7.14	8.42	6.67	6.50	6.88	6.53	7.61			12.12			14.82
Cleveland	20	6.18	7.12	7.90	6.58	6.50	6.79	6.34	7.65			11.89			14.39
Denver		7.95	8.85	10.10	8.20	9.55	7.95	7.95	8.05	9.05					15.25
Detroit	20	6.35	7.25	8.34	6.30	7.36	6.53-	6.93	6.56	7.60	12.27	12.12	14.52	13.44-	15.75
Houston	20	7.15	7.85		7.45			7.20	7.35	7.45	9.85		12.95		14.62
Kansas City	20	6.85	7.79	8.72	7.09			7.05	7.13	6.95	8.08				
Los Angeles	20	7.25	9.00	9.60	7.55	10.75-	11.30	7.20	7.35	7.15-	9.10	13.40-	13.05	15.75	16.05
Memphis	10	6.79	7.69		6.90			7.01	7.09	6.88	7.89				
Milwaukee	20	6.35	7.29	8.22	6.59			6.50-	6.63	6.45	7.57		11.92		14.42
New Orleans	15	6.51	7.56	8.25	6.63			6.73	6.81	6.60	8.42-				
New York	30	6.78	7.75	9.02	7.16	9.05	6.99	6.90	7.06	8.53	11.99-	10.39-	14.04-	12.64-	
Norfolk	20	6.90			7.20			7.15	7.20	7.20	8.50				
Philadelphia	25	6.53	7.55	8.35	7.02			6.63	6.67	6.87	8.24	12.04	11.89	14.29	14.39
Pittsburgh	20	5.95	6.82	8.30	6.20			6.03-	6.07	5.98-	7.65		11.45-		13.75-
Portland	10	8.00	9.80	9.95				6.33	6.46	6.28		11.75			14.25
Salt Lake City	20	9.05	10.80	10.65	9.35			8.70	8.85	9.20	11.25				
San Francisco	15	7.35	8.70	9.90	7.60	10.35		7.20	7.25	7.15	9.75-	13.55	12.80-	15.50	15.55
Seattle	20	8.15	8.70	9.95	8.02			7.59	7.50	7.58	10.13		13.05		16.05
St. Louis	20	6.48	7.42	8.35	6.72			6.73	6.86	6.58	7.70	12.20	12.05	14.45	14.30-
St. Paul	15	6.84	7.78	8.71	7.08			6.99	7.12	6.94	8.06		12.19		14.55

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity. Exceptions: (*) 500 to 1499 lb. (**) 20,000 lb or over. (*) 450 to 1499 lb. (**) 500 to 9999 lb.

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Calculation by the operator is unnecessary. The speed change handle is moved so that diameter of work within the range of the lathe registers with specified cutting speed in feet per minute, and the lathe automatically makes the necessary change.

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